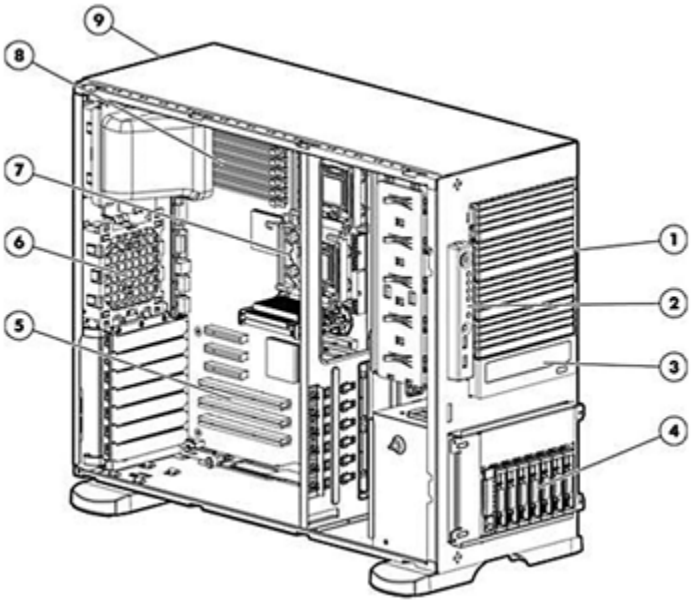
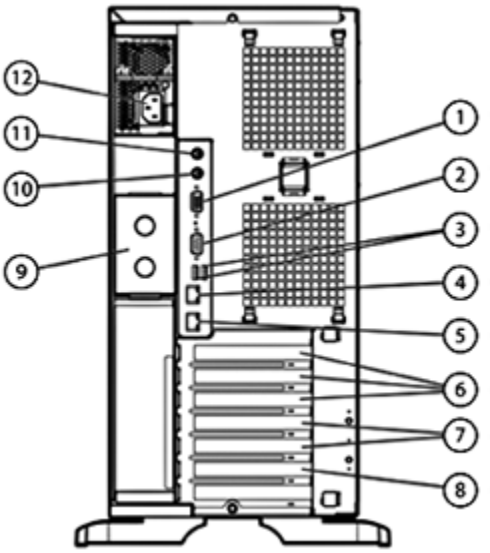
Overview





Front View:

1. Five removable media bays
2. Front display panel; includes power button, UID, two USB 2.0 ports, and system status LED's
3. CD-ROM Drive (Dual-Core models), DVD-ROM Drive (Quad-Core models)
4. Eight SFF (2.5") (shown) or six LFF (3.5") SAS or SATA Hot Plug drive bays
5. Six expansion slots (three PCI Express, three PCI-X)
6. Two system fans standard with support for optional redundant system fans
7. Support for two Intel® Dual-Core or Quad-Core Xeon® 5000 sequence processors
8. Eight PC2-5300 FB-DIMM (DDR2 667) memory sockets
9. Single Hot-Plug power supply standard, optional second redundant supply for availability

Rear View:

1. Monitor port
2. Serial port
3. USB ports
4. Integrated Lights-Out 2 (iLO2) port
5. Network port
6. PCI Express x4
7. PCI-X 64/100
8. PCI-X 64/133
9. Access to add 2nd redundant power supply
10. Mouse port
11. Keyboard port
12. Power

At A Glance

Building on a tradition of excellence, the HP ProLiant family introduces the fifth generation HP ProLiant ML350 server. The HP ProLiant ML350 G5 server provides Multi-Core performance, enterprise level management, and highly available redundant options in a modular server form factor. New for this generation is a smaller and quieter chassis, embedded Smart Array E200i Controller and 5 media bays.

- **Processors**:
  - Quad-Core and Dual-Core Intel® Xeon® processors for blazing performance; systems support up to 2 processors
  - 1333/1066/667 MHz front side bus (FSB)
  - Intel® 5000Z chipset
- **Memory**:
  - Eight PC2-5300 Fully Buffered DIMMs (DDR2 667) sockets with online-spare support for cost-effective memory configuration and expansion and 2:1 interleaving
  - Up to 16 GB of memory supported on Dual-Core 5000 and 5100 series

Overview

- Up to 32 GB of memory supported on Dual-Core 5200 series, Quad-Core 5300 and 5400 series

- **Storage Controllers**:
  - Entry Models: HP Smart Array E200i/64MB Controller (integrated SAS/SATA Hot-Plug Controller with RAID 0/1/1+0 support)
    - 128MB BBWC optional upgrade kit for RAID 5 support also available
  - Base Models: HP Smart Array E200i/128 BBWC Controller (RAID 0/1/1+0/5)
- **Internal Drive Support**:
  - Up to eight SFF (2.5") or six LFF (3.5") Hot Plug Serial Attached SCSI (SAS) or Serial-ATA (SATA) hard drives
  - Maximum of 6TB of internal storage capacity (using Hot-Plug SATA drives)
- **Network Controller**:
  - Embedded NC373i Multifunction Gigabit Network Adapter with TCP/IP Offload Engine, including support for Accelerated iSCSI through an optional Licensing Kit
- **Expansion Slots**:
  - Six total expansion slots
  - One 64-bit/133-MHz PCI-X; two 64-bit/100-MHz PCI-X; three x8 PCI Express (x4 speed)
  - Optional PCI-X Expander provides additional two 64-bit/100-MHz PCI-X slots by converting a single PCI Express slot
  - A single x8 PCI Express slot with x8 bus speed can be achieved by attaching the x4/x8 PCIE Bus Expander option kit. (Please see the chart and notes in the Expansion Slots under Standard Features below for more details)
- **USB Ports**:
  - Six USB 2.0 ports: (2) front; (2) rear; (2) internal
- **Redundancy**:
  - Optional Hot plug redundant power supplies
  - Support for optional redundant system fans
- **Management**:
  - HP Insight Control suite delivers essential management, including proactive health management, lights out remote control, optimization of power usage, rapid server deployment, performance analysis, vulnerability scanning and patch management and virtual machine management. For more information, go to: www.hp.com/go/ice.
  - HP ProLiant Onboard Administrator (powered by the Integrated Light-Out 2 management processor) for simplified server setup, health monitoring and recovery, power and thermal control, and lights-out remote administration
  - Integrated Lights-Out 2 Advanced unlocks the full capabilities of the ProLiant Onboard Administrator with high performance Integrated Remote Console, multi-user console sharing, video record and replay, and virtual media, including virtual folders for rapid server updates.
- **Operating Systems and Virtualization Software Support for ProLiant Servers:**
  - Supports Windows, RHEL, SLES, OEL, NetWare
- **Deployment/Serviceability**:
  - Optional parallel and second serial port available without using a PCI slot
  - Tool-free chassis entry and component access
  - Tool-free motherboard removal
  - Universal rail solution supporting both square and round hole rack environments
  - Customer Self Repair (CSR): HP products are designed with many CSR parts to minimize repair time and allow for greater flexibility in performing defective parts replacement
- **Warranty**:
  - This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners resellers. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. SATA hard drives have a one-year warranty.
  - **NOTE:** Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have HP replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at: http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html

Standard Features

NOTE: For a brief, printer friendly data sheet that describes this product and informs you of the essential capabilities and specifications, please visit: http://h71028.www7.hp.com/ERC/downloads/4AA0-6362ENW.pdf.
NOTE: For the Standard Features shipped in the "Factory Integrated Models", please see the "Configuration Information - Factory Integrated Models" section.

Processor One of the following depending on Model	**Quad-Core Processors** Quad-Core Intel® Xeon® Processor X5460 (3.16 GHz, 120 Watts, 1333 FSB) Quad-Core Intel® Xeon® Processor E5440 (2.83 GHz, 80 Watts, 1333 FSB) Quad-Core Intel® Xeon® Processor L5420 (2.50 GHz, 50 Watts, 1333 FSB) Quad-Core Intel® Xeon® Processor E5405 (2.00 GHz, 80 Watts, 1333 FSB) Quad-Core Intel® Xeon® Processor X5355 (2.66 GHz, 120 Watts, 1333 FSB) Quad-Core Intel® Xeon® Processor E5345 (2.33 GHz, 80 Watts, 1333 FSB) Quad-Core Intel® Xeon® Processor E5335 (2.00 GHz, 80 Watts, 1333 FSB) Quad-Core Intel® Xeon® Processor E5430 (2.66 GHz, 80 Watts, 1333 FSB) Quad-Core Intel® Xeon® Processor E5420 (2.50 GHz, 80 Watts, 1333 FSB) Quad-Core Intel® Xeon® Processor E5410 (2.33 GHz, 80 Watts, 1333 FSB) Quad-Core Intel® Xeon® Processor E5320 (1.86 GHz, 80 Watts, 1066 FSB) Quad-Core Intel® Xeon® Processor E5310 (1.60 GHz, 80 Watts, 1066 FSB) **Dual-Core Processors** Dual-Core Intel® Xeon® Processor X5260 (3.33 GHz, 80 Watts, 1333 FSB) Dual-Core Intel® Xeon® Processor E5205 (1.86 GHz, 65 Watts, 1066 FSB) Dual-Core Intel® Xeon® Processor 5160 (3.0 GHz, 80 Watts, 1333 FSB) Dual-Core Intel® Xeon® Processor 5150 (2.66 GHz, 65 Watts, 1333 FSB) **NOTE:** Available via Configure-To-Order only. See Factory Integrated Models section for more information. Dual-Core Intel® Xeon® Processor 5140 (2.33 GHz, 65 Watts, 1333 FSB) Dual-Core Intel® Xeon® Processor 5130 (2.00 GHz, 65 Watts, 1333 FSB) Dual-Core Intel® Xeon® Processor 5120 (1.86 GHz, 65 Watts, 1066 FSB)
Cache Memory One of the following depending on Model	12MB (2 x 6MB) Level 2 cache (5400 series) 8MB (2 x 4MB) Level 2 cache (5300 series) 6MB (1 x 6MB) Level 2 cache (5200 series) 4MB (1 x 4MB) Level 2 cache (5100 series) 4MB (2 x 2MB) Level 2 cache (5000 series)
Upgradeability	Upgradeable to 2 processors (4 or 8 cores) **NOTE:** Future upgradeable to Xeon® Series 5400/5300 Quad-Core processors (Please contact your regional sales support to determine quad core upgradeability. Some of the earlier shipping models may not support this upgrade). 5100 Dual-Core models are not upgradeable to the 5200 Dual-Core processors.
Chipset	Intel® 5000Z Chipset **NOTE:** For more information regarding Intel® chipsets, please see the following URL: http://www.intel.com/products/server/chipsets/.

Standard Features

Memory Protection
Online spare
Advanced ECC

Memory
One of the following depending on model

Type	PC2-5300 Fully Buffered DIMMs (DDR2-667)
Standard (Entry Models)	512 MB (1 x 512 MB) on Dual-Core Models
	1 GB (2 x 512 MB) on Quad-Core 5300 series
	1 GB (2 x 512 MB) on Quad-Core 5400 series
Standard (Base Models)	1 GB (2 x 512 MB) on Dual-Core Models
	1 GB (2 x 512 MB) on Quad-Core 5300 series
	2 GB (2 x 1 GB) on Quad-Core 5400 series
Maximum (Dual-Core 5000 & 5100 series)	16 GB (8 x 2 GB)
Maximum (Dual-Core 5200, Quad-Core 5300 & 5400 series)	32 GB (8 x 4 GB)

Network Controller
Embedded NC373i Multifunction Gigabit Network Adapter with TCP/IP Offload Engine, including support for Accelerated iSCSI through an optional Licensing Kit

Expansion Slots

Expansion Slot #	Technology	Bus Width	Connector Width*	Bus Number**	Form Factor	Notes
6	PCI Express	x4	x8	15	Standard Height/Length	
5	PCI Express	x4	x8	6	Standard Height/Length	
4	PCI Express	x4	x8	9	Standard Height/Length	
3	64-bit / 100MHz PCI-X	NA	NA	12	Standard Height/Length	PCI-X 100MHz
2	64-bit / 100MHz PCI-X	NA	NA	12	Standard Height/Length	PCI-X 100MHz
1	64-bit / 133MHz PCI-X	NA	NA	20	Standard Height/Length	PCI-X 133MHz

NOTES:
* Default bus assignment. Inserting cards with PCI bridges may alter the actual bus assignment number.
** Slots are enumerated differently based on OS. MS OS's enumerate from lowest to highest Device ID by bus (starting with the lowest bus).

Storage Controller

Entry Models	HP Smart Array E200i/64MB Controller
Base Models	HP Smart Array E200i/128 BBWC Controller

NOTE: Supports RAID 0/1/1+0 with 64MB of Cache, upgradeable to 128MB with BBWC for RAID 5 support.

Standard Features

Storage	Diskette Drives	None included standard
	Optical Drive One of the following depending on model	Quad-Core 5400 series: 16x SATA DVD-ROM drive Quad-Core 5300 series: 16x PATA DVD-ROM drive Dual-Core: 48x IDE CD-ROM drive **NOTE:** Quad-Core 5400 series BTO Models are configured with SATA optical drive.
	Hard Drives	None included standard

Maximum Internal Storage One of the following depending on model	Hot Plug LFF (3.5") Serial ATA (SATA)	6TB	6 x 1TB
	Hot Plug LFF (3.5") Serial Attached SCSI (SAS)	6TB	6 x 1TB
	Hot Plug SFF (2.5") SATA	2.0TB	8 x 250GB
	Hot Plug SFF (2.5") SAS	2.4TB	8 x 300GB

Interfaces	Parallel	Optional parallel port available
	Serial	1 (optional 2nd serial port available)
	Pointing Device (Mouse)	1
	Graphics	1
	Keyboard	1
	Network RJ-45	2 (1 dedicated for iLO 2)
	USB 2.0 Ports	6 (2 front, 2 rear, 2 internal) **NOTE:** Please see the following URL for additional information regarding USB support: http://h18004.www1.hp.com/products/servers/platforms/usb-support.html.

Graphics

Integrated ATI ES1000, 32MB video standard

- 16 bit color: maximum resolution of 1600 x 1200
- 32 bit color: maximum resolution of 1280 x 1024

NOTE: Maximum resolution available via iLO 2 remote console is 1280 x 1024.

Form Factor

Tower or Rack (5U)

NOTE: Rack models (and rack conversion kit) support:

- Square or round hole racks 24"- 36" deep, including HP Rack System /E and HP Systems
- Telco racks with 3rd part option kit from Rack Solutions
  http://www.racksolutions.com/hp

Standard Features

HP Insight Control suite

HP Insight Control suite delivers essential infrastructure management, including proactive health management, lights out remote control, optimization of power usage, rapid server deployment, performance analysis, vulnerability scanning and patch management and virtual machine management.

HP Insight Control suite installs and licenses the following components by default using a wizard-based integrated installer:

- HP Systems Insight Manager (SIM)
- HP iLO Advanced Pack
- HP Insight Rapid Deployment software (RDP)
- HP Insight Power Manager (IPM)
- HP Insight Performance Manager module (PMP)
- HP Insight Vulnerability and Patch Manager Module (VMP)
- HP Insight Virtual Machine Manager software for ProLiant (VMM)

Additional Insight software standalone products and management tools included on the Insight Software media kit can be installed manually:

- HP Insight Server Migration software for ProLiant (SMP)
  NOTE: HP Insight Server Migration software for ProLiant is licensed separately from the Insight Control suite.
- HP Open Service Event Manager
- HP Insight Remote Support Standard
- HP Insight Remote Support Advanced (previously Service Essentials Remote Support Pack)

NOTE: Insight Server Migration software for ProLiant can be installed from the SMP CD included in the Insight Software media kit.
NOTE: For additional product and licensing information about HP Insight Control suite, visit: http://www.hp.com/go/ice.

NOTE: As of Feb. 1, 2009, HP iLO Power Management Pack is being discontinued. Customers can either purchase HP Insight Control suite which contains all the components of IPMP or the standalone components which include iLO Advanced, Insight Power Manager and Systems Insight Manager.

HP Insight Control suite for Linux (ICE-LX) provides comprehensive discovery, imaging & deployment, monitoring, and management for Linux-based ProLiant server platforms. Built on the industry-leading HP Systems Insight Manager framework, this solution integrates open source technology with experience leveraged from HP's Linux products in HP ICLE and HP XC Clusters, while providing paths to the future with developing management technologies.

HP Insight Control suite and most Insight software products include a one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, please visit: http://www.hp.com/services/insight.

Standard Features

HP ProLiant Onboard Administrator

HP ProLiant Onboard Administrator (powered by the Integrated Lights-Out 2 management processor) simplifies server setup, health monitoring, power and thermal control, and lights-out remote administration of ProLiant ML, DL, and BL servers. HP ProLiant Onboard Administrator functions without additional software, and can be accessed from any location via a web browser. It works hand-in-hand with HP Systems Insight Manager, Insight Control, and Insight Dynamics - VSE suite helping customers unlock the value of the ProLiant platform and deliver the highest possible quality of IT service to the business.

Capabilities of the HP ProLiant Onboard Administrator embedded in ProLiant ML/DL servers include, but are not limited to the following:

- Rom-based Setup Utility (RBSU) and Option Rom Configuration for Arrays (ORCA)
- IML and iLO event logging
- Automatic Server Recovery (ASR)
- OS independent hardware health status
- Present server power consumption
- Virtual Unit ID control
- Remote serial console
- Virtual power button control
- Dynamic Sector Repairing (with Smart Array controller)
- Drive Parameter Tracking (with Smart Array controller)
- Hot Spare Boot
  NOTE: Upon the event of a failed processor in a multi-processing environment, the system will automatically reboot and attempt to use the remaining good processor.

Unlock the full remote administration capabilities of HP ProLiant Onboard Administrator with Integrated Lights-Out 2 Advanced.

Server Management Stand Alone Software Products

HP Systems Insight Manager (SIM)	HP Systems Insight Manager (HP SIM) provides a unified, secure and extensible standards-based environment to centrally manage servers, storage and other infrastructure devices, (both HP and non-HP) across multiple operating system platforms. For additional information, please see: www.hp.com/go/hpsim
HP Insight Rapid Deployment software (RDP)	Insight Rapid Deployment software (RDP) extends HP Systems Insight Manager with a complete deployment solution for HP ProLiant servers. RDP provides a central location to configure server hardware, deploy Windows, Linux and VMware ESX operating environments and install HP ProLiant Support Pack drivers using images and scripted profiles. For more information, visit: http://www.hp.com/go/rdp.
HP Insight Server Migration software for ProLiant (SMP)	Upgrading, replacing, or virtualizing your existing server? Effortlessly transition to new virtual or physical HP ProLiant servers or BladeSystem with automated, accurate and affordable migration of OS, application and data. Insight Server Migration software for ProLiant (SMP) automates the manual processes required for migrating servers between physical or virtual platforms, whether migrating to VMware or Microsoft virtual machines. Insight Server Migration software for ProLiant allows all of the following migrations: • physical to ProLiant • physical to virtual • virtual to virtual • virtual to ProLiant **NOTE:** For more information, visit: http://www.hp.com/go/migrate.
HP Insight Dynamics - VSE suite for ProLiant (ID-VSE)	The HP Insight Dynamics - VSE suite for ProLiant is advanced infrastructure management software that allows you to analyze and optimize your adaptive infrastructure to manage physical and virtual

		resources in the same way. HP Insight Dynamics - VSE gives you a powerful toolkit to accelerate complex technology projects and simplify daily operations. It enables you to plan capacity and power continuously, balance across physical and virtual resources, ensure cost-effective high availability and provision infrastructure consistently. **NOTE:** For more information, visit: http://www.hp.com/go/insightdynamics
	HP Integrated Lights-Out (iLO) Advanced Pack	Unlocks the full capabilities of the ProLiant Onboard Administrator with comprehensive remote control including Virtual KVM remote graphical console, power management capabilities such as power measurement, regulation, and capping, new iLO Text Console, automatic and on-demand video recording of server events, global team collaboration for up to four remote users, virtual media (floppy, CD/DVD, USB key), virtual folders, and enterprise security (directory services and two-factor authentication). For additional information, please see: www.hp.com/go/iLO
	HP Insight Power Manager software (IPM)	Upgrades the single-server remote management capabilities of iLO Select/Advanced to include centralized reporting and policy-based management of power consumption and thermal output provided by the Insight Power Manager. IPM unifies all of this functionality within a single user interface - HP Systems Insight Manager. For additional information, please see: www.hp.com/go/ipm
	HP Insight Virtual Machine Manager software for ProLiant (VMM)	Get the most out of server virtualization by unifying the management of physical and virtual servers in HP Systems Insight Manager software. The Insight Virtual Machine Manager software for ProLiant provides central management and control of VMware and Microsoft virtual machines and provides physical host to virtual machine association. For additional information, please see: http://www.hp.com/go/vm-manage.
	NOTE: Flexible and volume quantity license kits are available for Insight software products. Refer to: http://www.hp.com/ go/insightcontrol or the various Insight software product QuickSpecs for more information.	
Core Infrastructure Management	HP Foundation Pack	Managing the growing number of servers can be complex and expensive for your organization. IT managers need to address changing business needs with tools that meet the challenges of managing today's complex Datacenters. HP provides management solutions that are designed to simplify a server's installation, configuration and maintenance throughout the entire server lifecyle. This provides the customer with higher levels of operational efficiency and highly reliable systems: www.hp.com/go/foundation. The foundation pack includes: • HP SmartStart • HP Management • HP ProLiant Firmware Maintenance SmartStart version supported (minimum): SmartStart 7.60. http://www.hp.com/servers/smartstart
	Insight Management Agents	The Insight Management Agents should be installed on all HP servers to present system instrumentation, health and configuration information into HP Systems Insight Manager and the HP System Management Homepage. The HP System Management Homepage aggregates systems data from Insight Management Agents and other HP

	management tools, providing a consolidated browser-based interface for managing individual servers. Insight Management Agents and The HP System Management Homepage are included on ProLiant Support Packs, and can also be installed using the server profiles provided with the Rapid Deployment Pack For additional information about the Management Agents and the HP System Management Homepage please visit the management Web site at: http://www.hp.com/servers/manage.
Subscriber's Choice	Subscriber's Choice Driver and Support Alerts/Notifications is a web-based email subscription service that provides software and driver change notifications for ProLiant products. Sign up at: http://www.hp.com/go/subscriberschoice and customize your profile to receive various new alerts as they become available, on a weekly or monthly basis.
ProLiant Support Packs and ROMPaq, software	The latest software, drivers, and firmware fully optimized and tested for your ProLiant server and options, available through ProLiant Support Packs the ProLiant Essentials Rapid Deployment Pack, SmartStart or downloaded from software and drivers download pages website at: http://www.hp.com/go/support.

HP Serviceguard for Linux (SGLX)

HP Serviceguard for Linux provides high availability clustering for Linux applications running on HP Integrity, HP ProLiant and other supported industry-standard servers. Serviceguard for Linux reduces planned and unplanned downtime and delivers efficient, continuous access to business-critical applications - with all of the enterprise features you expect from HP.

This high availability clustering solution is designed to protect applications and services from a wide variety of software and hardware failures, monitoring the health of each server (node) and quickly responding to failures such as those that affect system processes, system memory, LAN media and adapters, and application processes.

For the most recent list of Linux distributions & kernels, servers and storage supported with Serviceguard for Linux, please see:
ftp://ftp.compaq.com/pub/products/servers/ha/linux/SGLX_Certification_Matrix.pdf

The following is a quick summary of HP Serviceguard for Linux features and support:

- Supported Virtual Machines
  - SG/LX in HP Integrity Virtual Machines guests
  - SG/LX in VMware ESX guests
  - SG/LX in Red Hat and SUSE Xen hosts (DOM0)
- Application Integration Toolkits
  - HP Serviceguard for Linux Oracle Database Toolkit
  - HP Serviceguard Extension for SAP on Linux (SGeSAP/LX)
  - Free Application Integration Toolkits:
    - Apache
    - MySQL
    - NFS
    - PostgreSQL
    - Samba
    - Tomcat
    - Sendmail
- Disaster Tolerant Solutions
  - HP Serviceguard for Linux Extended Distance Cluster (XDC) extends cluster distances up to 100 km, utilizes software RAID mirroring for data replication and is

Standard Features

storage array independent
    - HP StorageWorks XP/EVA Cluster Extension Software for Linux (CLX) works seamlessly with HP Serviceguard for Linux, HP StorageWorks Continuous Access, and HP Disk Arrays to automate failover and failback between sites
- Software updates are distributed by HP Services to customers with support contracts

NOTE: For additional information including software and server support on HP Serviceguard for Linux, visit: http://www.hp.com/go/sglx or see the HP Serviceguard for Linux QuickSpecs.
NOTE: HP Serviceguard for Linux products for HP ProLiant and select 3rd party x86 class servers include one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, please visit: http://www.hp.com/services/swsupport.

Industry Standard Compliance	ACPI V2.0 Compliant PCI 2.2 Compliant PXE Support WOL Support PCI-X 1.0a Compliant Novell Certified Microsoft® Logo certifications USB 2.0
Availability	Optional Hot-Plug, Redundant Power supply Online-Spare Memory Optional Dual Redundant System Fans
System Management	HP Systems Insight Manager SmartStart Redundant ROM System Firmware Update ROMPaq ProLiant RBSU (ROM-Based Setup Utility) Automatic Server Recovery-2 (ASR-2) Dynamic Sector Repairing (with Smart Array Controller) Drive Parameter Tracking (with Smart Array Controller) Pre-Failure Warranty (covers processors, memory, and SAS hard drives)
Security	Power-on password Setup password Diskette boot control Parallel and serial interface control Disk configuration lock Power switch security

Standard Features

Server Power Cords	ProLiant ML servers in a rack-mount configuration no longer ship standard with NEMA power cords that allow connection to 110V US wall outlets in a home or office. These servers are primarily connected to PDU's in data center racks so they now ship standard with only a PDU power cord (416151-B21). If a user wishes to power a ProLiant ML rack-mount server using a 110V receptacle (NEMA-15), the NEMA power cord must be ordered separately. The 12' cord (AF556A) or 6' cord (187335-001) can be purchased online at HP.COM. In a tower configuration, the servers ship standard with a 6' country specific NEMA power cord. If customers require a local power cord, they can check the power cord matrix for the appropriate country specific sku. Please see the following power cord matrix: http://www.hp.com/go/powercordmatrix.
UPS and PDU Power Cord Matrix	Please see the UPS and PDU cable matrix that lists cable descriptions, requirements, and specifications for UPS and PDU units: http://h18004.www1.hp.com/products/servers/proliantstorage/power-protection/index.html
Power Supply	800 Watt-CE Mark Compliant Hot Plug Power Supply (1000 Watt high line) Optional second Power Supply provides redundant capability **NOTE:** Please see the "Power Specifications" section later in this document for low line and high line requirements.
System Fans	2 fans ship standard, dual redundant fans are optional, 4 fans total supported (does not include power supply or processor heat sink fans)
Required Cabling	For required cabling information, refer to the HP ProLiant ML350 G5 cabling matrix at: http://www.hp.com/servers/proliantML350. **NOTE:** Please see the "Storage" section of this QuickSpecs for important information on controllers and cables required to support SAS or SATA hard drives as well as storage management software available for SATA hard drives.
Operating Systems and Virtualization Software Support for ProLiant Servers	Microsoft Windows Server Microsoft Windows Server Hyper V Red Hat Enterprise Linux (RHEL) SUSE Linux Enterprise Server (SLES) Oracle Enterprise Linux (OEL) NetWare **NOTE:** For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at: http://www.hp.com/go/supportos and our driver download page www.hp.com/support/ML350G5.
Installation of Server into Telco Racks	Support for all 2-post Telco racks requires the use of the HP ProLiant ML350 G5 rack kit and an additional option kit from Rack Solutions. http://www.racksolutions.com/hp.

Standard Features

Factory Express Portfolio for Servers and Storage

HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed.

Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant, HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSAxxxx, VA7xxx, EVA, XP, rackable tape libraries and configurable network switches.

For more information on Factory Express services for your specific server model please contact your sales representative or go to: http://www.hp.com/go/factory-express.

HP Enterprise Configurator

The HP eConfigure-Enterprise Configurator now provides factory default racking for our HP hardware portfolio. This approach is aligned with our strategic direction to meet the needs and expectations of our valued customers. If you require "custom" rack configuration, please contact HP's Customer Business Center or an Authorized Partner for assistance.

Service and Support

HP Care Pack services provide total care and support expertise with committed response designed to meet your IT and business needs.

HP Care Pack services include coverage for the HP branded hardware options qualified for the server and purchased at the same time or afterward that are internal to the enclosure. This also includes the 22" and smaller external monitors and tower UPS options up to 3kVA. These items will be covered at the same service level and for the same coverage period as the server. Coverage of UPS Battery is not included, and standard warranty terms & conditions apply. For servers or storage systems installed within a rack, service also covers all HP qualified rack options installed within the same rack.

To fully capitalizing on your HP ProLiant servers' capabilities requires a service partner who thoroughly understands your server technology and systems environment. HP Services, an industry leader in provision of multi vender support solutions, provides a range of support services designed to meet the varying needs of your business. Whether an SMB, or large global corporation, HP has a ProLiant server support offer to help you speedily deploy and maximize system uptime.

Recommended Service - simplify ProLiant solution implementation, maintenance, and management.

- **Support** - 3-Year 4-Hour response 24x7 Same Business Day Coverage only
- **Deployment Service** - Installation and Start up only

Enhanced Service - optimize service level to increase IT performance and availability.

- **Support** - 3-Year Support Plus 24 only

Refer to the information on "Installation & Start-Up" for service on ProLiant server and Microsoft or Linux O/S per the Customer Description and/or Data Sheet; to be delivered on a scheduled basis 8am-5pm, M-F, excluding HP holidays.

NOTE: For a complete listing of service offerings and information visit:
http://www.hp.com/services/proliantservices
http://www.hp.com/go/proliant/carepack

Models

NOTE: For the Standard Features shipped in the "Factory Integrated Models", please see the "Configuration Information - Factory Integrated Models" section.
NOTE: Please note that SFF tower or rack models can only be configured with SFF 2.5" SAS or SATA hard drives and LFF tower or rack models can be only configured with LFF 3.5" SAS or SATA hard drives.

HP ML350 G5 Entry Models **Tower Quad-Core Models** **HP ML350T05 E5420 LFF** 458239-xx1 **HP ML350T05 E5410 LFF** 458244-xx1 **Rack Quad-Core Models HP ML350R05 E5420 LFF** 458240-xx1	**Processor(s)** One of the following depending on Model	(1) Quad-Core Intel® Xeon® E5420 Processor (2.50 GHz, 80 Watts, 1333 FSB) (1) Quad-Core Intel® Xeon® E5410 Processor (2.33 GHz, 80 Watts, 1333 FSB)
	Cache Memory	12MB (2x6MB) Level 2 cache - 5400 Series 8MB (2 x 4MB) Level 2 cache - 5300 Series
	Memory One of the following depending on Model	Quad-Core 5400 Series: 1GB (2 x 512MB) Quad-Core 5300 Series: 1GB (2x512MB)
	Network Controller	Embedded NC373i Multifunction Gigabit Server Adapter
	Storage Controller	Smart Array E200i/64 Controller (RAID 0/1/1+0)
	Hard Drive	None Ship Standard; (0/6 LFF)
	Internal Storage	6TB LFF SATA 6TB LFF SAS
	Optical Drive One of the following depending on Mode	Quad-Core: 16x DVD-ROM standard Dual-Core: 48x CD-ROM standard
	PCI-Express Slots	Six expansion slots (three PCI Express, three PCI-X)
	Power Supplies	800-Watt CE-mark compliant Hot-Plug power supply Optional second power supply provides redundant operation
	Fans	2 fans ship standard, 4 fans total supported (does not include power supply or processor heatsink fans)
	Form Factor One of the following depending on Model	Tower Rack (5U), (8.75 in/22.25 cm)

HP ML350 G5 Base Models **Tower Quad-Core Models** **HP ML350T05 E5430 SFF** 458238-xx1 **HP ML350T05 E5420 SFF** 458242-xx1 **HP ML350T05 E5410 SFF** 458246-xx1 **Rack Quad-Core Models** **HP ML350R05 E5430 SFF** 458237-xx1 **HP ML350R05 E5420 SFF**	**Processor(s)** One of the following depending on Model	(1) Quad-Core Intel® Xeon® E5430 Processor (2.66 GHz, 80 Watts, 1333 FSB) (1) Quad-Core Intel® Xeon® E5420 Processor (2.50 GHz, 80 Watts, 1333 FSB) (1) Quad-Core Intel® Xeon® E5410 Processor (2.33 GHz, 80 Watts, 1333 FSB)
	Cache Memory One of the following depending on Model	12MB (2 x 6MB) Level 2 cache - 5400 Series 8MB (2 x 4MB) Level 2 cache - 5300 Series
	Memory	Quad-Core 5400 Series: 2 GB (2 x 1GB) standard Quad-Core 5300 Series: 1 GB (2 x 512MB) standard
	Network Controller	Embedded NC373i Multifunction Gigabit Server Adapter
	Storage Controller	Smart Array E200i/128 BBWC Controller (RAID 0/1/1+0/5)
	Hard Drive	None Ship Standard; (0/8 SFF)
	Internal Storage	2.0TB SFF SATA 2.4TB SFF SAS
	Optical Drive One of the following depending on Model	Quad-Core: 16x DVD-ROM standard Dual-Core: 48x CD-ROM standard
	PCI-Express Slots	Six expansion slots (three PCI Express, three PCI-X)

Models

458243-xx1
HP ML350R05 E5320 SFF
440189-xx1

Power Supplies	800-Watt CE-mark compliant Hot-Plug power supply Optional second power supply provides redundant operation
Fans	2 fans ship standard, 4 fans total supported (does not include power supply or processor heatsink fans)
Form Factor One of the following depending on Model	Tower Rack (5U), (8.75 in/22.25 cm)

Country Code Key	**Tower Code Key**	**Rack Code Key**
XX=00	U.S. English	U.S. English
XX=01	Australia	N/A
XX=03	UK	N/A
XX=04	Germany	N/A
XX=05	France	N/A
XX=20	Brazil	N/A
XX=29	Japan	Japan
XX=37	APD	APD
XX=42	Europe	Europe
XX=AA	PRC	PRC

NOTE: This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for information on CTO product offerings and requirements.
NOTE: HP does not allow factory integration of options into standard models listed above. Configure-to-order servers must start with a CTO Chassis.
NOTE: FIO indicates that this option only available as a Factory Installable Option.

Step 1: Base Configuration (choose one of the following configurable models)

Models

ML350 G5 Tower Models

LFF - 3.5" Drives

HP ProLiant ML350G5 LFF SAS/SATA Tower CTO Chassis 412645-B21

Includes:

Embedded NC373i Multifunction Gigabit Server Adapter
Integrated Smart Array E200i Controller
Six Hot-Plug (LFF) SAS/SATA Drive Bays
Six expansion slots: one 64-bit/133-MHz PCI-X, two 64-bit/100-MHz PCI-X, and three x4 PCI Express (with x8 connectors)
Six USB ports
800W Hot-Plug Power Supply
Tower Form Factor
Keyboard
2-button Mouse

SFF - 2.5" Drives

HP ProLiant ML350G5 SFF SAS/SATA Tower CTO Chassis 395570-B21

Includes:

Embedded NC373i Multifunction Gigabit Server Adapter
Integrated Smart Array E200i Controller
Eight Hot-Plug (SFF) SAS/SATA Drive Bays
Six expansion slots: one 64-bit/133-MHz PCI-X, two 64-bit/100-MHz PCI-X, and three x4 PCI Express (with x8 connectors)
Six USB ports
800W Hot-Plug Power Supply
Tower Form Factor
Keyboard
2-button Mouse

ML350 G5 Rack Models

LFF - 3.5" Drives

HP ProLiant ML350G5 LFF SAS/SATA Rack CTO Chassis 412644-B21

Includes:

Embedded NC373i Multifunction Gigabit Server Adapter
Integrated Smart Array E200i Controller
Six Hot-Plug (LFF) SAS/SATA Drive Bays
Six expansion slots: one 64-bit/133-MHz PCI-X, two 64-bit/100-MHz PCI-X, and three x4 PCI Express (with x8 connectors)
Six USB ports
800W Hot-Plug Power Supply

Rack (5U) Form Factor

SFF - 2.5" Drives

HP ProLiant ML350G5 SFF SAS/SATA Rack CTO Chassis	395569-B21

Includes:

Embedded NC373i Multifunction Gigabit Server Adapter

Integrated Smart Array E200i Controller

Eight Hot-Plug (SFF) SAS/SATA Drive Bays

Six expansion slots: one 64-bit/133-MHz PCI-X, two 64-bit/100-MHz PCI-X, and three x4 PCI Express (with x8 connectors)

Six USB ports

800W Hot-Plug Power Supply

Rack (5U) Form Factor

Step 2: Choose Required Options (only one of the following from each list unless otherwise noted)

Processors	**Quad-Core Processors**	
	Quad-Core Intel® Xeon® Processor X5460 (3.16 GHz, 120 Watts, 1333 FSB) ML350G5 FIO Kit	493457-L21
	Quad-Core Intel® Xeon® Processor E5440 (2.83 GHz, 80 Watts, 1333 FSB) ML350G5 FIO Kit	458257-L21
	Quad-Core Intel® Xeon® Processor E5430 (2.66 GHz, 80 Watts, 1333 FSB) ML350G5 FIO Kit	458259-L21
	Quad-Core Intel® Xeon® Processor L5420 (2.50 GHz, 50 Watts, 1333 FSB) ML350G5 FIO Kit	493459-L21
	Quad-Core Intel® Xeon® Processor E5420 (2.50 GHz, 80 Watts, 1333 FSB) ML350G5 FIO Kit	458265-L21
	Quad-Core Intel® Xeon® Processor E5410 (2.33 GHz, 80 Watts, 1333 FSB) ML350G5 FIO Kit	458267-L21
	Quad-Core Intel® Xeon® Processor E5405 (2.00 GHz, 80 Watts, 1333 FSB) ML350G5 FIO Kit	458269-L21
	Dual-Core Processors	
	Dual-Core Intel® Xeon® Processor X5260 (3.33 GHz, 80 Watts, 1333 FSB), ML350G5 FIO Kit	493461-L21
	Dual-Core Intel® Xeon® Processor E5205 (1.86 GHz, 65 Watts, 1066 FSB) ML350G5 FIO Kit	458725-L21
Base Memory	512 MB FBD PC2-5300 1 x 512 MB Kit Single Rank Kit	413507-B21
	1 GB FBD PC2-5300 2 x 512 MB Single Rank Kit	397409-B21
	2 GB FBD PC2-5300 2 x 1 GB Dual Rank Kit	397411-B21
	2 GB FBD PC2-5300 2 x 1 GB Low Power Single Rank Kit	461826-B21
	4 GB FBD PC2-5300 2 x 2 GB Dual Rank Kit	397413-B21
	4 GB FBD PC2-5300 2 x 2 GB Low Power Dual Rank Kit	461828-B21
	8 GB FBD PC2-5300 2 x 4 GB Dual Rank Kit	397415-B21
	8 GB FBD PC2-5300 2 x 4 GB Low Power Dual Rank Kit	466440-B21

NOTE: Memory Option Kits include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, please visit: http://h18004.www1.hp.com/products/servers/platforms/energyefficient/.

Configuration Information - Factory Integrated Models

Smart Array E200i Controller Cache	HP SA E200 64MB Cache FIO Kit **NOTE:** Select this option for RAID 0/1/1+0	405102-B21
	128-MB Battery-Backed Write Cache (BBWC) **NOTE:** Select this option for RAID 0/1/1+0/5.	351580-B21
Optical Drive	CD-RW/DVD-ROM Combo Drive Option Kit	331346-B21
	HP DVD±R/RW 16X Half Height	383974-B21
	16X DVD-ROM Drive Option Kit (Carbon)	217053-B21
	HP Half-Height SATA DVD-ROM Optical Drive	447326-B21
	HP Half-Height SATA DVD RW Optical Drive	447328-B21

Step 3: Choose Additional Factory Integratable Options

Controllers	HP Smart Array P400/256 MB Controller **NOTE:** SAS Controller supporting RAID 0/1/1+0/5.	405132-B21
	HP Smart Array P600/256 BBWC Controller **NOTE:** SAS Controller supporting RAID 0/1/1+0/5/6.	337972-B21
	Smart Array 642 Controller **NOTE:** U320 Controller.	291967-B21
	Smart Array 6402/128 Controller **NOTE:** U320 Controller.	273915-B21
	Smart Array 6404/256 Controller **NOTE:** U320 Controller.	273914-B21
	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21
	HP Smart Array 6404/512 FIO CNTRLR	452240-B21

Step 4: Choose Additional Options for Factory Integration

NOTE: For additional options, please refer to the "Core Options" and "Additional Options" section below.

Core Options

NOTE: Some options may not be factory configurable. Please contact your local sales representative for additional information.

HP ProLiant ML350 G5 Unique Options	HP Redundant Fan ML350 G5 Kit	409579-B21
	HP PCI-X Expander Kit (2 x 64-bit 100MHz PCI-X slots) **NOTE:** The HP PCI-X Expander kit converts a single PCI Express slot (slot 6) into two full height, full length 64-bit 100MHz PCI-X slots. **NOTE:** The HP PCI-X Expander kit can support a maximum of one (1) HP Smart array, HBA, or SCSI PCI-X adapter. Prioritize internal slots for use with PCI-X storage controllers. Please refer to the ML350G5 user guide for additional details.	435670-B21
	HP Tower to Rack Conversion Kit - ML350 G5 Kit **NOTE:** See "Redundant Options" section below for Hot Plug Redundant Power supplies.	412640-B21
Processors	**Quad-Core Processors**	
	Quad-Core Intel® Xeon® Processor X5460 (3.16 GHz, 120 Watts, 1333 FSB)	493457-B21
	Quad-Core Intel® Xeon® Processor E5440 (2.83 GHz, 80 Watts, 1333 FSB)	458257-B21
	Quad-Core Intel® Xeon® Processor E5430 (2.66 GHz, 80 Watts, 1333 FSB)	458259-B21
	Quad-Core Intel® Xeon® Processor L5420 (2.50 GHz, 50 Watts, 1333 FSB)	493459-B21
	Quad-Core Intel® Xeon® Processor E5420 (2.50 GHz, 80 Watts, 1333 FSB)	458265-B21
	Quad-Core Intel® Xeon® Processor E5410 (2.33 GHz, 80 Watts, 1333 FSB)	458267-B21
	Quad-Core Intel® Xeon® Processor E5405 (2.00 GHz, 80 Watts, 1333 FSB)	458269-B21
	Quad-Core Intel® Xeon® Processor X5355 (2.66 GHz, 120 Watts, 1333 FSB)	436015-B21
	Quad-Core Intel® Xeon® Processor E5345 (2.33 GHz, 80 Watts, 1333 FSB)	436013-B21
	Quad-Core Intel® Xeon® Processor E5335 (2.00 GHz, 80 Watts, 1333 FSB)	437444-B21
	Quad-Core Intel® Xeon® Processor E5320 (1.86 GHz, 80 Watts, 1066 FSB)	435512-B21
	Quad-Core Intel® Xeon® Processor E5310 (1.6 GHz, 80 Watts, 1066 FSB)	435513-B21
	Dual-Core Processors	
	Dual-Core Intel® Xeon® Processor X5260 (3.33 GHz, 80 Watts, 1333 FSB)	493461-B21
	Dual-Core Intel® Xeon® Processor E5205 (1.86 GHz, 65 Watts, 1066 FSB)	458725-B21
	Dual-Core Intel® Xeon® Processor 5160 (3.0 GHz, 80 Watts, 1333 FSB)	416891-B21
	Dual-Core Intel® Xeon® Processor 5150 (2.67 GHz, 65 Watts, 1333 FSB)	416890-B21
	Dual-Core Intel® Xeon® Processor 5140 (2.33 GHz, 65 Watts, 1333 FSB)	416889-B21
	Dual-Core Intel® Xeon® Processor 5130 (2.0 GHz,65 Watts, 1333 FSB)	416888-B21
	Dual-Core Intel® Xeon® Processor 5120 (1.86 GHz, 65 Watts, 1066 FSB)	416887-B21
	Dual-Core Intel® Xeon® Processor 5110 (1.6 GHz, 65 Watts, 1066 FSB)	416886-B21

Core Options

Memory (DIMMs)	512 MB FBD PC2-5300 1 x 512 MB Kit Single Rank Kit	413507-B21
	1 GB FBD PC2-5300 2 x 512 MB Single Rank Kit	397409-B21
	2 GB FBD PC2-5300 2 x 1 GB Dual Rank Kit	397411-B21
	2 GB FBD PC2-5300 2 x 1 GB Low Power Single Rank Kit	461826-B21
	4 GB FBD PC2-5300 2 x 2 GB Dual Rank Kit	397413-B21
	4 GB FBD PC2-5300 2 x 2 GB Low Power Dual Rank Kit	461828-B21
	8 GB FBD PC2-5300 2 x 4 GB Dual Rank Kit	397415-B21
	8 GB FBD PC2-5300 2 x 4 GB Low Power Dual Rank Kit	466440-B21
	NOTE: Memory Option Kits include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, please visit: http://h18004.www1.hp.com/products/servers/platforms/energyefficient/	
Optical Drives	Floppy Drive ML350/370 G5 Kit	409582-B21
	CD-RW/DVD-ROM Combo Drive Option Kit	331346-B21
	HP DVD±R/RW 16X Half Height	383974-B21
	16X DVD-ROM Drive Option Kit (Carbon)	217053-B21
	HP Half-Height SATA DVD-ROM Optical Drive	447326-B21
	HP Half-Height SATA DVD RW Optical Drive	447328-B21
	NOTE: Please note that some of the earlier BTO models may not support adding SATA Optical Drives. To ensure compatibility of the SATA Optical Drives, please add additional optical drives only on models with Quad-Core 5400 Series processors.	
Hard Drives	**NOTE:** Transfer rates of drives are dependent on the maximum transfer rate supported by the HBA or Controller. Refer to the HBA or Controller technical specifications for details.	
	SAS Hot Plug SFF Enterprise (ENT) Drives	
	NOTE: Please note that SFF 2.5" (small form factor) drives can only be installed on tower or rack models with SFF chassis (models).	
	HP 300GB 6G SAS 10K SFF DP ENT HDD	507127-B21
	HP 300GB 3G SAS 10K SFF DP ENT HDD	492620-B21
	HP 146GB 6G SAS 10K SFF DP ENT HDD	507125-B21
	HP 146GB 3G SAS 15K SFF DP ENT HDD	504062-B21
	HP 146GB 3G SAS 10K SFF DP ENT HDD	418367-B21
	HP 146GB 3G SAS 10K SFF SP HDD	431958-B21
	HP 72GB 3G SAS 15K SFF DP ENT HDD	418371-B21
	HP 72GB 3G SAS 15K SFF SP HDD	431935-B21
	HP 72GB 3G SAS 10K SFF DP ENT HDD	384842-B21
	HP 72GB 3G SAS 10K SFF SP HDD	375861-B21
	HP 36GB 3G SAS 15K SFF DP ENT HDD	418369-B21
	HP 36GB 3G SAS 15K SFF SP HDD	431933-B21
	SAS Hot Plug 3.5" Enterprise (ENT) Drives	
	NOTE: Please note that LFF 3.5" (large form factor) drives can only be installed on tower or rack models with LFF chassis (models).	
	HP 450GB 3G SAS 15K 3.5" DP ENT HDD	454232-B21
	HP 400GB 3G SAS 10K 3.5" DP ENT HDD	459508-B21
	HP 300GB 3G SAS 15K 3.5" SP HDD	431944-B21
	HP 300GB 3G SAS 15K 3.5" DP ENT HDD	416127-B21

Core Options

HP 146GB 3G SAS 15K 3.5" SP HDD	375872-B21
HP 146GB 3G SAS 15K 3.5" DP ENT HDD	384854-B21
HP 72GB 3G SAS 15K 3.5" SP HDD	375870-B21
HP 72GB 3G SAS 15K 3.5" DP ENT HDD	384852-B21
SAS Hot Plug 3.5" Midline (MDL) Drives	
HP 1TB 3G SAS 7.2K 3.5" DP MDL HDD	461137-B21
HP 750GB 3G SAS 7.2K 3.5" DP MDL HDD	461135-B21
NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12244_div/12244_div.html (Worldwide)	
SATA Hot Plug Entry (ETY) Drives	
HP 250GB 3G SATA 5.4K SFF ETY HDD	460355-B21
HP 120GB 1.5G SATA 5.4K SFF ETY HDD	458924-B21
HP 160GB 3G SATA 7.2K 3.5" ETY HDD	458945-B21
SATA Hot Plug Midline (MDL) Drives	
HP 1TB 3G SATA 7.2K 3.5" MDL HDD	454146-B21
HP 750GB 3G SATA 7.2K 3.5" MDL HDD	458930-B21
HP 500GB 3G SATA 7.2K 3.5" MDL HDD	458928-B21
HP 250GB 3G SATA 7.2K 3.5" MDL HDD	458926-B21
NOTE: SATA hard drives have a 1-year warranty. Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13021_div/13021_div.html (Worldwide)	
3.5" SATA Hot Plug Drives	
HP 750GB 1.5G SATA 7.2K 3.5" HDD	432341-B21
HP 500GB 1.5G SATA 7.2K 3.5" HDD	395473-B21
HP 250GB 1.5G SATA 7.2K 3.5" HDD	349239-B21
HP 160GB 1.5G SATA 7.2K 3.5" HDD	349238-B21
NOTE: The previous generation of 1.5G SATA drives are still supported. These drives can be purchased as an option, however they are no longer configurable.	
Small Form Factor (SFF) SATA Hot Plug Drives	
HP 120GB 1.5G SATA 5.4K SFF HDD	431786-B21
NOTE: SATA hard drives have a 1-year warranty. Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/11940_div/11940_div.html (Worldwide)	

Core Options

Communications	HP NC112T PCIe Gigabit Server Adapter	503746-B21
	HP NC360T PCI Express Dual Port Gigabit Server Adapter	412648-B21
	HP NC364T PCI Express Quad Port Gigabit Server Adapter **NOTE:** Does not support Windows 2000. **NOTE:** There is a maximum of five NC364T PCI Express Quad Port Gigabit Server Adapter NICs allowed in this server.	435508-B21
	HP NC373F PCI Express Multifunction Gigabit Server Adapter	394793-B21
	HP NC373T PCI Express Multifunction Gigabit Server Adapter	394791-B21
	HP NC380T PCI Express Dual Port Multifunction Gigabit Server Adapter **NOTE:** Supported on a full length-full height slot only.	394795-B21
	HP NC510F PCIe 10 Gigabit Server Adapter **NOTE:** A minimum of 1 gigabyte (1 GB) of server memory is required per each NC510F adapter.	414126-B21
	HP NC510C PCIe 10 Gigabit Server Adapter **NOTE:** A minimum of 1 gigabyte (1 GB) of server memory is required per each NC510C adapter.	414129-B21
	HP NC7170 PCI-X Dual Port 1000T Gigabit Server Adapter	313881-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: www.hp.com/go/ProLiantNICs	

Redundant Options	Hot Plug Redundant Power Supply 350/370/380 G5 AU Kit	399771-011
	Hot Plug Redundant Power Supply 350/370/380 G5 EU Kit	399771-021
	Hot Plug Redundant Power Supply 350/370/380 G5 JP Kit	399771-291
	Redundant Power Supply 350/370/380 G5 Kit (IEC Cord)	399771-B21
	Hot Plug Redundant Power Supply 350/370/380 G5 UK Kit	399771-031
	Redundant Power Supply 350/370/380 G5 Kit (NEMA Cord)	399771-001
	Redundant Fan ML350 G5 Kit	409579-B21

Additional Options

HP Insight Control suite

NOTE: Electronic licensing options are available for Insight Control suite software products. Please see the appropriate Insight Control QuickSpecs for additional information. www.hp.com/go/ice

HP Insight Control Environment

HP Insight Control Environment, No Media 1-Server License including 1 year of 24x7 Technical Support and Updates — 452148-B22
NOTE: This part number can be purchased as a single license or as multiple licenses with a single activation key. Customer will receive a license entitlement certificate via e-mail. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service. Only available directly from HP and select resellers in the Americas region.

HP Insight Software Media Kit — 436222-B21
NOTE: Insight Software DVD media without licenses. Contains Systems Insight Manager and Insight software products and components licensed by Insight Control suite. Uses an integrated installer to perform quick and accurate software installation and updates.

NOTE: For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12631_div/12631_div.html

HP Insight Control suite for Linux

HP Insight Control suite for Linux, Media pack (DVD) - No licenses included — 464422-B22
NOTE: This optional Media pack DVD contains the ISO image for HP Insight Control suite for Linux, HP System Insight Manager, HP Insight Power Manager, HP Insight Virtual Machine Manager software, and an integrated installer. Servers must be acquired separately.
NOTE: This Media pack is optional because the latest ISO image and latest updates may be downloaded at no cost from: http://www.hp.com/go/ice-linux (click on Download button).

HP Insight Control suite for Linux, No Media, 1-Server license, including one year of 24x7 Technical Support and Updates — 464423-B22
NOTE: This part number can be used to purchase one (1) license with a single activation key. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.
NOTE: One certificate is shipped for each license.

NOTE: For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/13019_div/13019_div.html

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Server Management Stand Alone Software Products - Insight software

NOTE: Electronic licensing options are available for select software products. Please see the appropriate Insight Software standalone product QuickSpecs for additional information.

Deploy

HP Insight Rapid Deployment software

HP Insight Rapid Deployment software No Media 1-Server License including 1 year of 24x7 Technical Support and Updates — 452151-B21
NOTE: This license allows 1 server to be deployed and managed via RDP. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service
NOTE: For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11053_div/11053_div.html

Additional Options

HP Insight Server Migration software for ProLiant

HP Insight Server Migration software, No Media, Physical / Virtual to ProLiant Single Migration License, including 1 year of 24x7 Technical Support and Updates **NOTE:** This license allows 1 physical to ProLiant or virtual to ProLiant migration. Customer will receive a printed license entitlement certificate and documentation via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.	460750-B21
HP Insight Server Migration software for ProLiant, No Media, Physical / Virtual to Virtual Single Migration License, including 1 year of 24x7 Technical Support and Updates **NOTE:** This license allows 1 physical to virtual or virtual to virtual migration. Customer will receive a printed license entitlement certificate and documentation via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.	460753-B21
HP Insight Server Migration software for ProLiant, No Media, 1-Year Unlimited Migration License, including 1 year of 24x7 Technical Support **NOTE:** This license allows unlimited migrations (physical to ProLiant, physical to virtual, virtual to virtual, and virtual to ProLiant) for one year. Customer will receive a printed license entitlement certificate and documentation via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service.	460756-B21

NOTE: For additional License Kits, please see the QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/12855_div/12855_div.html

Monitor

HP Insight Dynamics-VSE suite for ProLiant

HP Insight Dynamics-VSE with Insight Control Environment, 1-server license including 1 year of 24x7 Technical Support and Updates **NOTE:** This license supports HP ProLiant ML/DL servers. Customer will receive a printed license entitlement certificate via physical shipment.	483527-B21
HP Insight Dynamics-VSE without Insight Control Environment, 1-server license including 1 year of 24x7 Technical Support and Updates **NOTE:** This license supports HP ProLiant ML/DL and c-Class Blade servers. Customer will receive via email a receipt and link to a license entitlement certificate.	483531-B21

NOTE: For additional License Kits, please see the QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/13050_div/13050_div.html

Control

HP Integrated Lights-Out Advanced Pack

HP Integrated Lights-Out Advanced Pack, No Media, 1-Server License, including 1 year of 24x7 Technical Support and Updates **NOTE:** For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12362_div/12362_div.html	512485-B21

Optimize

HP Insight Virtual Machine Manager software for ProLiant

HP Insight Virtual Machine Manager software for ProLiant, No Media, 1-Server License, including 1 year of 24x7 Technical Support and Updates **NOTE:** Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.	452153-B21

Additional Options

NOTE: For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12328_div/12328_div.html

HP Insight Power Manager (IPM)

HP Insight Power Manager, No Media, 1-Server License, including 1 year of 24x7 Technical Support and Updates **NOTE:** Customers purchasing this upgrade must already have an iLO Advanced or Select license on each managed server. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service. **NOTE:** For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12623_div/12623_div.html **NOTE:** Flexible and volume quantity license kits are available for Insight software products. Refer to: http://www.hp.com/go/insightcontrol or the individual Insight software product QuickSpecs for more information.	452677-B21

Storage Controllers

SAS Controllers

Smart Array E200 Controller

HP Smart Array E200/128 BBWC Controller	411508-B21
128-MB Battery-Backed Write Cache (BBWC) **NOTE:** Supports the Smart Array E200 Controller and Smart Array 642 Controller.	351580-B21

Smart Array E500 Controller

HP Smart Array E500/256MB Controller	435129-B21
HP SA-P400 and SA-E500 24 In Battery Cable Kit **NOTE:** This option kit contains a 24" battery cable and adhesive material for installing a batter into the server if a Smart Array P400 is integrated outside of the factory. For all solutions, please refer to the server QuickSpecs and User's Manual for detailed installation instructions.	417836-B21

Smart Array P400 Controller

HP Smart Array P400/512MB BBWC Controller **NOTE:** Supports RAID 0/1/1+0/5/6.	411064-B21
HP Smart Array P400/256MB Controller **NOTE:** Supports RAID 0/1/1+0/5.	405132-B21
512MB Battery-backed cache (BBWC) upgrade **NOTE:** for Smart Array P400 Controller.	405148-B21
Battery-backed write cache (BBWC) upgrade **NOTE:** for Smart Array P400 Controller.	383280-B21
Smart Array P400 Battery Attach Kit **NOTE:** This option kit contains a 24" battery cable and adhesive material for installing a battery into the server if a Smart Array P400 is integrated outside of the factory. For all solutions, please refer to the server QuickSpecs and User's Manual for detailed installation instructions.	417836-B21

Smart Array P600 Controller

HP Smart Array P600/256 BBWC Controller **NOTE:** Supports internal or external drive attach.	337972-B21
512MB Battery-backed write cache (BBWC) upgrade **NOTE:** For Smart Array P600 Controller.	372538-B21

Smart Array P800 Controller

HP Smart Array P800/512 BBWC Controller **NOTE:** Supports internal or external drive attach.	381513-B21

Additional Options

NOTE: Please see the following QuickSpecs additional information:
http://h18000.www1.hp.com/products/quickspecs/12460_div/12460_div.html (Smart Array E200 Controller)
http://h18000.www1.hp.com/products/quickspecs/12700_div/12700_div.html (Smart Array E500 Controller)
http://h18000.www1.hp.com/products/quickspecs/12400_div/12400_div.html (Smart Array P400 Controller)
http://h18000.www1.hp.com/products/quickspecs/12247_div/12247_div.html (Smart Array P600 Controller)
http://h18000.www1.hp.com/products/quickspecs/12616_div/12616_div.html (Smart Array P800 Controller)

SAS HBA

HP SC08Ge Host Bus Adapter	488765-B21
HP SC44Ge Host Bus Adapter **NOTE:** When using the SC44Ge with SATA Hard Drives, 1.5G SATA Hard Drives are required. Transfer rate: 1.5 Gb/s, 3 Gb/s SAS.	416096-B21
HP 8 Internal Port SAS HBA with RAID **NOTE:** Transfer rate: 1.5 Gb/s, 3 Gb/s SAS.	347786-B21

NOTE: Please see the HBA QuickSpecs for additional information:
http://h18004.www1.hp.com/products/quickspecs/13082_div/13082_div.html (SC08Ge HBA)
http://h18004.www1.hp.com/products/quickspecs/12617_div/12617_div.html (SC44Ge HBA)
http://h18004.www1.hp.com/products/quickspecs/12332_div/12332_div.html (8 Internal Port SAS HBA)

SCSI Controllers for External Drive/Storage Support

Smart Array 6402/128 Controller **NOTE:** Ultra320 SCSI.	273915-B21
Smart Array 6404/256 Controller **NOTE:** Ultra320 SCSI.	273914-B21
Smart Array 642 Controller **NOTE:** Ultra320 SCSI.	291967-B21
128MB Battery-Backed Write Cache (BBWC) **NOTE:** Supports the Smart Array E200 Controller and Smart Array 642 Controller.	351580-B21
64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21

SCSI HBA

HP SC11Xe Host Bus Adapter **NOTE:** Supports external drive attach.	412911-B21

NOTE: Please see the following QuickSpecs for additional information:
http://h18000.www1.hp.com/products/quickspecs/11943_div/11943_div.html (Single Channel Ultra320 SCSI HBA)
http://h18000.www1.hp.com/products/quickspecs/11587_div/11587_div.html (Smart Array 6400 Series)
http://h18000.www1.hp.com/products/quickspecs/12069_div/12069_div.html (Smart Array 642)
http://h18000.www1.hp.com/products/quickspecs/12566_div/12566_div.html (SC11Xe HBA)

Additional Options

PCI Option	HP x4-x8 PCI-E Bus Expander Option Kit **NOTE:** The HP x4/x8 PCI Express Bus Expander kit converts 2 x4 PCI Express slots into a single x8 PCI Express slot for high performance x8 PCI Express cards.	403724-B21
Serial/Parallel Port Options	Parallel/Serial Port ML370/350 G5 Kit	401222-B21
Tape Drives	**NOTE:** For the complete listing of Tape Drive offerings, please see: http://www.hp.com/products1/storage/compatibility/tapebackup/ISS/index.html	
	SAS Tape Drives **NOTE:** For the ML350 G5, HP recommends purchasing the HP SC44Ge HBA (416096-B21) for a dedicated SAS HBA for tape.	
	HP StorageWorks DAT 160 SAS Internal Tape Drive	Q1587A
	HP StorageWorks LTO-2 Ultrium 448 SAS Internal Tape Drive	DW085A
	HP StorageWorks LTO-4 Ultrium 1760 SAS Internal Tape Drive	EH919A
	NOTE: Please refer to the "Tape Drives, Tape Autoloaders & Tape Libraries" table in the Storage section of this document for a list of SAS controllers with tape support.	
	SCSI Tape Drives **NOTE:** For the ML350 G5, HP recommends purchasing the HP 64-Bit/133-MHz Single Channel Ultra320 SCSI HBA (374654-B21) for a dedicated SCSI HBA for tape.	
	HP StorageWorks LTO-2 Ultrium 448 SCSI Internal Tape Drive (Carbonite)	DW016A
	HP StorageWorks LTO-4 Ultrium 1760 SCSI Internal Tape Drive	EH921A
	NOTE: Please see the HP StorageWorks LTO Ultrium Tape Drive QuickSpecs for additional options such as controllers, media, and other related items: http://h18006.www1.hp.com/products/quickspecs/11739_div/11739_div.html (Worldwide) http://h18006.www1.hp.com/products/quickspecs/12128_div/12128_div.html (Worldwide)	
	For an up-to-date listing of the latest O/S and software support details for HP Ultrium tape drives, please visit: http://www.hp.com/go/connect	

Additional Options

Disk-Based Backup	**RDX Removable Disk Backup**	
	HP StorageWorks RDX160 Internal Removable Disk Backup System **NOTE:** 160GB of Disk Storage.	AJ765A
	HP StorageWorks RDX320 Internal Removable Disk Backup System **NOTE:** 320GB of Disk Storage.	AJ767A
	HP RDX500 Int Removable Disk Backup System	AJ934A
	NOTE: Please see the HP RDX Removable Disk Backup System QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/13036_div/13036_div.html	
	D2D Backup	
	HP StorageWorks D2D120 Backup System with Data Protector Express Software Kit **NOTE:** 2TB of Disk Storage.	EH924A
	HP StorageWorks D2D130 Backup System with LTO-3 Ultrium 920 SAS Tape Drive **NOTE:** 3TB of Disk Storage.	EH952A
	HP StorageWorks D2D2503i Backup System **NOTE:** 3TB of Disk Storage.	EH945A
	HP StorageWorks D2D4004i Backup System **NOTE:** 4.5TB of Disk Storage.	EH938A
	NOTE: Please see the HP D2D Backup Systems QuickSpecs for additional information: http://www.hp.com/go/d2d.	
Tape Autoloaders	**HP StorageWorks DAT Autoloader**	
	HP StorageWorks DAT 72x10 tape Autoloader	AE313B
	HP StorageWorks 1/8 G2 Tape Autoloader	
	HP StorageWorks 1/8 G2 LTO-4 Ultrium 1760 SAS Tape Autoloader	AK377A
	HP StorageWorks 1/8 G2 LTO-3 Ultrium 920 SAS Autoloader	AH558A
	HP StorageWorks 1/8 G2 LTO-2 Ultrium 448 Tape Autoloader	AH164A
	HP StorageWorks 1/8 G2 Tape Autoloader Rack Kit **NOTE:** Required to install the 1/8 G2 Autoloaders in a standard 19-inch rack; includes rails and rackmount instructions	AH166A
	NOTE: Please reference the Tape Autoloader QuickSpecs at: http://www.hp.com/go/automation for additional information needed to create a complete solution.	

Additional Options

Tape Libraries	**HP StorageWorks MSL2024 Tape Library**	
	HP StorageWorks MSL2024 1 LTO-4 Ultrium 1840 SCSI Drive Library	AJ033A
	HP StorageWorks MSL2024 1 LTO-4 Ultrium 1760 SAS Drive Library	AK378A
	HP StorageWorks MSL2024 1 LTO-3 Ultrium 960 SCSI Drive Library	AG115A
	HP StorageWorks MSL2024 1 LTO-3 Ultrium 920 SAS Drive Library	AH559A
	HP StorageWorks MSL2024 1 LTO-2 Ultrium 448 SCSI Drive Library	AG116A
	HP StorageWorks MSL4048 Tape Library	
	HP StorageWorks MSL4048 1 LTO-4 Ultrium 1840 SCSI Drive Library	AJ035A
	HP StorageWorks MSL4048 2 LTO-4 Ultrium 1760 SAS Drive Library	AK380A
	HP StorageWorks MSL4048 1 LTO-3 Ultrium 960 SCSI Drive Library	AG322A
	HP StorageWorks MSL4048 1 LTO-3 Ultrium 920 SAS Drive Library	AH560A
	NOTE: Please reference the MSL Tape Library QuickSpecs at: http://www.hp.com/go/automation for additional information needed to create a complete solution; reference current compatibility information at: http://www.hp.com/go/ebs.	

High Availability Cluster Options	**HP Serviceguard for Linux**	
	HP Serviceguard for Linux on HP ProLiant and other third-party x86 Servers - Physical Media Kit **NOTE:** This kit contains media only.	519353-B21
	HP Serviceguard for Linux on HP ProLiant and other third-party x86 Servers Single-Server License Licensed per Server **NOTE:** This license allows Serviceguard for Linux to be installed on 1 server. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.	519354-B21
	HP Serviceguard for Linux - Flexible-Quantity License (for HP ProLiant and other third-party x86 servers) Licensed per Server **NOTE:** This part number can be used to purchase multiple licenses with a single activation key. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service	519355-B21
	HP Serviceguard Linux Oracle Database Toolkit for HP ProLiant/x86 Servers Licensed per cluster Includes media and One Year 24x7 Software Support & Updates	463833-B21
	HP Serviceguard Extension for SAP on Linux for HP ProLiant/x86 Servers Licensed per physical server Includes media and One Year 24x7 Software Support & Updates	463834-B21
	HP Serviceguard Linux Extended Distance Cluster (XDC) for HP ProLiant/x86 Servers Licensed per physical server Includes media and One Year 24x7 Software Support & Updates	463835-B21
	NOTE: For a detailed list of supported configuration/certification options for HP Serviceguard for Linux please refer to the HP Serviceguard for Linux Certification Matrix at: http://www.hp.com/go/sglx/info **NOTE:** HP Serviceguard for Linux products running on x86 platforms now include one year of 24 x 7 Software Technical Support and Updates. Please see the Support Information section of the HP Serviceguard for Linux QuickSpecs for details.	

Additional Options

NOTE: For additional information including a complete list of Product Numbers for HP Serviceguard for Linux, please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11518_div/11518_div.html (Worldwide)

StorageWorks Options

NOTE: The following is a list of all Fibre Channel Host Bus Adapters for Windows and Linux. For detailed compatibility information please see: http://h18006.www1.hp.com/storage/saninfrastructure/hba.html

HP StorageWorks FC2142SR 4Gb PCI-e HBA	A8002A
HP StorageWorks FC2242SR Dual Channel 4 Gb PCI-e HBA	A8003A
HP StorageWorks FC1142SR 4Gb PCI-e HBA	AE311A
HP StorageWorks FC1242SR Dual Channel 4 Gb PCI-e HBA	AE312A
HP StorageWorks FC2143 4Gb PCI-X 2.0 -to-Fibre Channel HBA	AD167A
HP StorageWorks FC2243 Dual Channel 4Gb PCI-X 2.0 HBA	AD168A
HP StorageWorks FC1143 4Gb PCI-X 2.0 HBA	AB429A
HP StorageWorks FC1243 Dual Channel 4Gb PCI-X 2.0 HBA	AE369A
HP StorageWorks 81Q PCI-e FC HBA	AK344A
HP StorageWorks 8Gb Simple SAN Connection Kit	AK241A
HP StorageWorks 8/20q Fibre Channel Switch	AK242A
HP StorageWorks 81E 8Gb SP PCI-e FC HBA	AJ762A
HP 82E 8Gb Dual-port PCI-e FC HBA	AJ763A
HP 82Q 8Gb Dual Port PCI-e FC HBA	AJ764A

HP StorageWorks 20 Modular Smart Array

HP StorageWorks Modular Smart Array 335921-B21

NOTE: Rack-mountable 12 (SATA) drive enclosure with U320 Host connectivity, redundant power supplies.

NOTE: The Modular Smart Array Enclosure 20 Family supports the SATA 1.5Gb/s 3.5" Hot Plug Hard Drives.

HP StorageWorks 50 Modular Smart Array

HP StorageWorks 50 Modular Smart Array 364430-B21

NOTE: Please see the Modular Smart Array 50 QuickSpecs for additional information including configuration steps and additional options needed for a complete solution at: http://h18000.www1.hp.com/products/quickspecs/12245_div/12245_div.html (Worldwide)

HP StorageWorks 60 Modular Smart Array

HP StorageWorks 60 Modular Smart Array 418408-B21

NOTE: Please see the Modular Smart Array 60 QuickSpecs for additional information including configuration steps and additional options needed for a complete solution at: http://h18000.www1.hp.com/products/quickspecs/12627_div/12627_div.html (Worldwide)

Additional Options

HP StorageWorks 70 Modular Smart Array	HP StorageWorks 70 Modular Smart Array	418800-B21
	NOTE: Please see the Modular Smart Array 70 QuickSpecs for additional information including configuration steps and additional options needed for a complete solution at: http://h18000.www1.hp.com/products/quickspecs/12652_div/12652_div.html (Worldwide)	
HP StorageWorks 2000sa Modular Smart Array	HP 2012sa Single Controller Modular Smart Array	AJ752A
	HP 2012sa Dual Controller Modular Smart Array	AJ753A
	NOTE: Please see the Modular Smart Array 2000sa QuickSpecs for additional options and configuration information at: http://h18000.www1.hp.com/products/quickspecs/13045_div/13045_div.html (Worldwide)	
Uninterruptible Power Systems – Tower	**HP T1000v Uninterruptible Power System**	
	HP T1000v UPS	AF443A
	NOTE: The T1000v is available in China and India only.	
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/13130_div/13130_div.html (Worldwide)	
	HP T1500 G3 UPS Models	
	HP T1500 G3 UPS, NA	AF450A
	HP T1500 G3 UPS, INTL	AF451A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/13160_div/13160_div.html (Worldwide)	
	HP R/T 2200 G2 UPS	
	HP, R/T 2200 UPS NA	AF409A
	HP, R/T 2200 UPS JPN	AF410A
	HP, R/T 2200 UPS INTL	AF411A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/13179_div/13179_div.html (Worldwide)	
	NOTE: For additional information on HP Uninterruptable Power Systems please go to: www.hp.com/servers/rackups.	

Additional Options

Uninterruptible Power Systems - Rack	**HP R1500 G2 UPS**	
	HP, R1.5kVA UPS, 1U, NA	AF419A
	HP, R1.5kVA UPS, 1U, INTL	AF418A
	HP, R1.5kVA UPS, 1U, JPN/TW	AF421A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/12507_div/12507_div.html (Worldwide)	
	HP R3000 UPS	
	HP R3000 VA UPS, 2U, DTC, INTL	AF414A
	HP R3000 VA UPS, 2U, Low voltage L5-30, NA	AF422A
	HP R3000 VA UPS, 2U, High voltage L6-20, NA	AF423A
	HP R3000 VA UPS, 2U, High voltage L6-20, JPN	AF424A
	HP R3000 VA UPS, 2U, Low voltage L5-30, JPN	AF425A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/10671_div/10671_div.html (Worldwide)	
	HP R3000v Uninterruptible Power System	
	HP R3000v UPS **NOTE:** The R3000v is available in China and India only.	AF444A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/13129_div/13129_div.html (Worldwide)	
	HP Rack-Mountable R5500 UPS	
	HP R5500 VA UPS, INTL	AF416A
	HP R5500 VA UPS, NA/JPN	AF426A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/11871_div/11871_div.html (Worldwide)	
	NOTE: For additional information on HP Uninterruptable Power Systems please go to: www.hp.com/servers/rackups.	

HP Monitored Power Distribution Unit (PDU)	**HP Monitored Power Distribution Unit: Full Rack Version**	
	HP 17.3 kVA S2324 Monitored PDU- dual input, 3Ø24A (NA/JPN)	AF503A
	HP 8.6 kVA S1324 Monitored PDU- single input, 3Ø, 24A (NA/JPN)	AF504A
	HP 16.6 kVA S2140 Monitored PDU- dual input, 1Ø, 40A (NA/JPN)	AF505A
	HP 8.3 S1140 Monitored PDU- single input, 1Ø, 40A (NA/JPN)	AF506A
	HP 22.1 kVA S2316 Monitored PDU- dual input, 3Ø, 16A (INTL)	AF507A
	HP 11 kVA S1316 Monitored PDU- single input, 3Ø, 16A (INTL)	AF508A
	HP 14.7 kVA S2132 Monitored PDU- dual input, 1Ø, 32A (INTL)	AF509A
	HP 7.3 kVA S1132 Monitored PDU- single input, 1Ø, 32A (INTL)	AF510A
	HP 4.9 kVA S124 Monitored PDU- single input, 1Ø, 24A (NA/JPN)	AF914A
	HP 7.3 kVA S132 Monitored PDU- single input, 1Ø, 32A (INTL)	AF915A

Additional Options

Modular PDUs 1U/0U (Up to 32 outlets) **NOTE:** 1U/0U mounting brackets shipped with the unit (optimized for 10000 and 9000 series racks).	3.6kVA Model - mPDU, 16A, High (WW)	252663-B24
	2.8 kVA Model - mPDU, 24A, Low (NA/JPN)	252663-D71
	4.9kVA Model - mPDU, 24A, High (NA/JPN)	252663-D72
	7.3kVA Model - mPDU, 32A, High (INT'L)	252663-B31
	8.3kVA Model - mPDU, 40A, High (WW)	252663-B21
	8.3kVA Model - mPDU, 40A, High (power cord attached) (NA/JPN)	252663-D73
	9.2kVA Model - mPDU, 40A, High (power cord attached) (INTL)	252663-B32
	8.3kVA Model - mPDU 40A, High (core only) (NA/JPN)	252663-D75
	9.2kVA Model - mPDU 40 A, High (core only) (Int'l)	252663-B34
	8.3kVA Model - mPDU 32A, High (core only) (Int'l)	252663-B33
	4.9kVA Model - mPDU 24A, High (core only) (NA/JPN)	252663-D74
	NOTE: For additional information on HP Power Distribution Units including accessories please go to: www.hp.com/go/pdu (Worldwide)	
Rack Kits	HP ML350 G5 Tower to Rack Conversion Kit	412640-B21
USB Options	HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver)	DC172B
	USB 1.44-MB External Diskette Drive (Carbonite)	DC141B
	HP USB 04 Standard Keyboard	DT528A# ABA
	HP 1GB USB 2.0 Floppy Drive Key	442085-B21
HP Rack 5000 Series (Graphite Metallic)	HP 5642 Rack-Unassembled	358254-B21
	NOTE: Please see the HP Rack 5642 QuickSpecs for additional part numbers and Technical Specifications such as height, width, depth, weight, and color: http://h18000.www1.hp.com/products/quickspecs/12074_div/12074_div.html (Worldwide)	
	NOTE: For additional information regarding Rack Cabinets, please see the following URL: http://www.hp.com/go/rackandpower.	
HP Rack 10000 G2 Series (Carbon/Graphite Metallic)	10642 G2 (42U) Rack Cabinet - Pallet	AF001A
	10642 G2 (42U) Rack Cabinet - Shock Pallet	AF002A
	10642 G2 (42U) Rack Cabinet - Crated	AF003A
	10642 G2 (42U) Rack Cabinet, with Extension - Shock Pallet	AF004A
	10636 G2 (36U) Rack Cabinet - Pallet	AF011A
	10636 G2 (36U) Rack Cabinet - Shock Pallet	AF012A
	10636 G2 (36U) Rack Cabinet - Crated	AF013A
	10636 G2 (36U) Rack Cabinet, with Extension - Shock Pallet	AF014A
	10622 G2 (22U) Rack Cabinet - Pallet	AF021A
	10622 G2 (22U) Rack Cabinet - Shock Pallet	AF022A
	10642 G2 (42U) Rack Cabinet 1200mm Deep - Shock Pallet	AF034A
	10642 G2 (42U) Rack Cabinet 1200mm Deep - Pallet	AF038A
	10842 G2 (42U) 800mm Wide Rack Cabinet - Pallet	AF041A
	10842 G2 (42U) 800mm Wide Rack Cabinet - Shock Pallet	AF042A
	10647 G2 (47U) Rack Cabinet - Pallet	AF031A
	HP S10614 (14U) Rack Cabinet - Shock Pallet	292302-B22

Additional Options

	10647 G2 (47U) Rack Cabinet 1200mm Deep - Shock Pallet **NOTE:** Due to handling and shipping requirements, AF044A is only orderable through HP Factory Express. It is not for direct sales. Customer site surveys are required before an order is approved. CTO orders may require additional lead time.	AF044A
	10647 G2 (47U) Rack Cabinet 1200mm Deep - Pallet **NOTE:** It is mandatory to use a shock pallet when shipping racks with equipment installed. **NOTE:** xxxxxx-B22 (shock pallet) used to ship racks with equipment installed (by custom systems, VARs and Channels). **NOTE:** Please see the Rack 10000 G2 QuickSpecs for Technical Specifications such as height, width, depth, weight, and color: http://h18000.www1.hp.com/products/quickspecs/12402_div/12402_div.html (Worldwide) **NOTE:** For additional information regarding Rack Cabinets, please see the following URL: http://www.hp.com/go/rackandpower.	AF045A

Keyboards and Monitors	TFT7600 Rackmount Keyboard Monitor US	AG052A
	TFT7600 Rackmount Keyboard Monitor UK	AG053A
	TFT7600 Rackmount Keyboard Monitor GR	AG054A
	TFT7600 Rackmount Keyboard Monitor FR	AG055A
	TFT7600 Rackmount Keyboard Monitor IT	AG056A
	TFT7600 Rackmount Keyboard Monitor SP	AG057A
	TFT7600 Rackmount Keyboard Monitor DEN	AG058A
	TFT7600 Rackmount Keyboard Monitor NOR	AG059A
	TFT7600 Rackmount Keyboard Monitor SE/FI	AG060A
	TFT7600 Rackmount Keyboard Monitor SWI	AG061A
	TFT7600 Rackmount Keyboard Monitor PORT	AG062A
	TFT7600 Rackmount Keyboard Monitor BEL	AG063A
	TFT7600 Rackmount Keyboard Monitor JPN2	AG064A
	TFT7600 Rackmount Keyboard Monitor RUS	AG065A
	TFT7600 Rackmount Keyboard Monitor INTL	AG066A
	1U Rackmount Keyboard with USB, US	AG072A
	1U Rackmount Keyboard with USB, UK	AG073A
	1U Rackmount Keyboard with USB, GR	AG074A
	1U Rackmount Keyboard with USB, FR	AG075A
	1U Rackmount Keyboard with USB, ITL	AG076A
	1U Rackmount Keyboard with USB, SP	AG077A
	1U Rackmount Keyboard with USB, DEN	AG078A
	1U Rackmount Keyboard with USB, NOR	AG079A
	1U Rackmount Keyboard with USB, SE/FI	AG080A
	1U Rackmount Keyboard with USB, SWI	AG081A
	1U Rackmount Keyboard with USB, PORT	AG082A
	1U Rackmount Keyboard with USB, BEL	AG083A
	1U Rackmount Keyboard with USB, JPN2	AG084A
	1U Rackmount Keyboard with USB, RUS	AG085A
	1U Rackmount Keyboard with USB, INTL	AG086A
	NOTE: For additional information regarding Rack Options, please see the following URL: http://www.hp.com/go/rackandpower.	

Additional Options

HP KVM Switch Options	2x1x16 IP Console Switch with Virtual Media	AF601A
	4x1x16 IP Console Switch with Virtual Media	AF602A
	2x16 Server Console Switch with Virtual Media	AF600A
	PS/2 Virtual Media Interface Adapter, 1 pack **NOTE:** Requires PS/2 and one USB port on server.	AF604A
	Server console switch 0x2x8	AF616A
	Server console switch 0x2x16	AF617A
	PS/2 Interface Adapter, 1 pack	262588-B21
	PS/2 Interface Adapter, 8 pack	262587-B21
	NOTE: Cat5e cables are required to connect Interface Adapters to Console Switches. Cat5e cables can be found at the following URL: http://www.hp.com/go/kvm.	
	HP 1x4 Console Switch	AF611A
	PS2 Server Console Cable, 6 ft, 2 pack	AF612A
	NOTE: For additional information regarding KVM switches, Serial Console servers, rack mount monitors, keyboards and all related options please see the following URL: http://www.hp.com/go/kvm.	
HP Serial Console Server Options	HP 16 Port Serial Console Server (worldwide)	AF101A
	HP 48 Port Serial Console Server (worldwide)	AF102A
	Serial Adapter, RJ45-DB9 DCE Female, 1 Pack	AF103A
	Serial Adapter, RJ45-DB9 DCE Female, 8 Pack	AF110A
	NOTE: Cat5e cables are required to connect Serial Adapters to Serial Console Servers. Additional Serial Adapters and Cat5e cables can be found at the following URL: http://www.hp.com/go/kvm.	
	NOTE: For additional information regarding KVM switches, Serial Console servers, rack mount monitors, keyboards and all related options please see the following URL: http://www.hp.com/go/kvm.	
Service and Support Offerings (HP Care Pack Services)	**Hardware Services On-site Service**	
	4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years (Electronic)	U4512E
	4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years (Electronic)	U4513E
	6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years (Electronic)	U4514E
	O/S and Hardware Installation	
	Hardware Installation (Electronic)	U4522E
	Installation & Start-Up of a ProLiant server and Microsoft or Linux O/S per the Customer Description and/or Data Sheet. To be delivered on a scheduled basis 8am-5pm, M-F, excl. HP holidays. (Electronic)	U4523E
	Support Plus	
	Onsite HW support, 8am-9pm, M-F, 4hr response and Microsoft O/S SW Tech support offsite, onsite at HP's discretion, 8am-9pm, M-F 2hr response time excl. HP holidays. (Electronic)	U4524E
	Support Plus 24	
	Onsite HW support 24x7, 4hr response and Microsoft O/S SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, Electronic	U4525E

Additional Options

Onsite HW support 24x7, 4hr response and SuSE Linux SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, Electronic	U6308E
Onsite HW support 24x7, 4hr response and Red Hat ES Linux SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, Electronic	U8330E

NOTE: For more information, customer/resellers can contact: http://www.hp.com/services/carepack

Memory

NOTE: Memory configurations listed do not apply to "Factory Integrated Models".

HP ProLiant ML350 G5 Memory Configuration

The HP ProLiant ML350 G5 requires memory interleaving when more than one DIMM is installed. For interleaving, DIMMs must be configured in identical pairs. The system will not boot properly if multiple DIMMs of varying density or type are installed in the system.

Standard Memory

All HP ProLiant ML350 G5 models ship with PC2-5300 Fully Buffered DIMMs (DDR2-667).
Entry models include a single 512 MB DIMM (Dual-Core) or two 512 MB DIMMs (Quad-Core).
Base models include two 512 MB DIMMs (1 GB total memory) or two 1 GB DIMMs (2 GB total memory)
Factory Integrated Models include the memory capacity of your choice.

Common Memory Configuration

Valid DIMM pair combinations use slots 1/5, slots 2/6, slots 3/7, and slots 4/8. Maximum supported memory is 16 GB for Dual-Core 5000 and 5100 series models and 32 GB on Quad-Core 5300 and 5400 series models.

NOTE: Chart does not represent all possible memory configurations.

Memory		Slot							
		1A	2B	3C	4D	5A	6B	7C	8D
Standard	1 GB	512 MB	Empty	Empty	Empty	512 MB	Empty	Empty	Empty
Optional	13 GB	512 MB	2 GB	2 GB	2 GB	512 MB	2 GB	2 GB	2 GB
Maximum	32 GB	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB	4 GB

Following are memory options available from HP:

512 MB FBD PC2-5300 1 x 512 MB Kit Single Rank Kit	413507-B21
1 GB FBD PC2-5300 2 x 512 MB Single Rank Kit	397409-B21
2 GB FBD PC2-5300 2 x 1 GB Dual Rank Kit	397411-B21
2 GB FBD PC2-5300 2 x 1 GB Low Power Single Rank Kit	461826-B21
4 GB FBD PC2-5300 2 x 2 GB Dual Rank Kit	397413-B21
4 GB FBD PC2-5300 2 x 2 GB Low Power Dual Rank Kit	461828-B21
8 GB FBD PC2-5300 2 x 4 GB Dual Rank Kit	397415-B21
8 GB FBD PC2-5300 2 x 4 GB Low Power Dual Rank Kit	466440-B21

NOTE: Memory Option Kits include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, please visit: http://h18004.www1.hp.com/products/servers/platforms/energyefficient/.

Online spare memory configuration

FBDIMMs can either be single-rank or dual-rank. Certain FBDIMM configuration requirements are based on these classifications. A dual-rank FBDIMM is similar to having two separate FBDIMMs, or ranks, on the same module. Although only a single FBDIMM module, a dual-rank FBDIMM acts as two separate FBDIMMs.

In online spare mode, a single rank of memory acts as the spare memory. For single-rank FBDIMMs, the entire FBDIMM acts as the spare memory. For a dual-rank FBDIMM, only half of the FBDIMM acts as the spare memory while the other half is available for operating system and application usage.

Online spare FBDIMM configuration requirements (in addition to general configuration requirements):

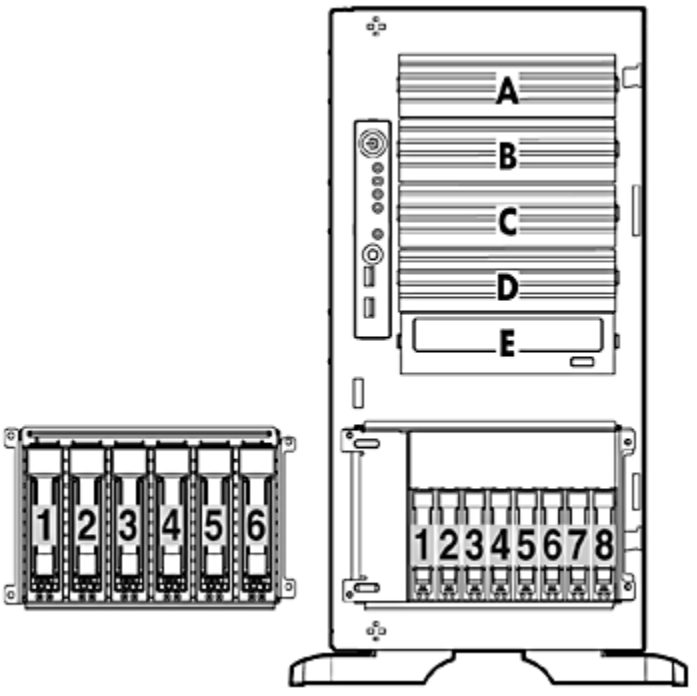
- When only bank A is being used, it must be fully populated with dual-rank FBDIMMs.
- For optimum memory usage, HP recommends all FBDIMMs be the same size with the same HP part number. If different sized FBDIMMs are used, a portion of the installed memory may not be utilized.

In online spare mode, FBDIMMs must be populated as specified in the following table:

- Configuration 1 (Bank A only) is only supported if using bank A, populated with dual-rank FBDIMMs.
- After installing FBDIMMs, use RBSU to configure the system for online spare memory support.

Memory

Bank A 1A and 5A	Bank B 2B and 6B	Bank C 3C and 7C	Bank D 4D and 8D
X	—	—	—
X	X	—	—
X	X	X	X



1 - 6	6 x 3.5" (LFF) Hot-Plug SAS/SATA hard drive bays
Or	
1 - 8	8 x 2.5" (SFF) Hot-Plug SAS/SATA hard drive bays
A,B,C,D	Available half height media bays
E	Optical Drive

Drive Support

	Quantity Supported	Position Supported	Controller
Removable Media			
1.44-MB Diskette Drive	Up to 1	A, B, C, D, E	Integrated SATA Controller
IDE (ATAPI) CD-ROM Drive	Up to 1	A, B, C, D, E	Integrated SATA Controller
HP DVD±R/RW 16X Half Height	Up to 1	A, B, C, D, E	Integrated SATA Controller
DVD-ROM Drive Option Kit	Up to 1	A, B, C, D, E	Integrated SATA Controller
HP Half-Height SATA DVD-ROM Optical Drive	Up to 1	A, B, C, D, E	Integrated SATA Controller
HP Half-Height SATA DVD RW Optical Drive	Up to 1	A, B, C, D, E	Integrated SATA Controller

Hard Drives

NOTE: Transfer rates of drives are dependent on the maximum transfer rate supported by the HBA or Controller. Refer to the HBA or Controller technical specifications for details.

SAS Hot Plug SFF Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
300GB 6G SAS 10K DP	Up to 8 SFF	1-8	HP Smart Array E200i/64MB Controller
300GB 3G SAS 10K DP			HP Smart Array E200i/128 BBWC Controller
146GB 6G SAS 10K DP			HP Smart Array E500/256MB Controller
146GB 3G SAS 15K DP			HP Smart Array P400/256MB Controller
146GB 3G SAS 10K SP			HP Smart Array P400/512MB BBWC Controller
146GB 3G SAS 10K DP			HP Smart Array P600/256 BBWC Controller
72GB 3G SAS 10K SP			HP Smart Array P800/512 BBWC Controller

Storage

72GB 3G SAS 10K DP
72GB 3G SAS 15K SP
72GB 3G SAS 15K DP
36GB 3G SAS 15K SP
36GB 3G SAS 15K DP

SAS Hot Plug 3.5" Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
450GB 3G 15K 3.5" DP 400GB 3G 10K 3.5" DP 300GB 3G SAS 15K SP 300GB 3G SAS 15K DP 146GB 3G SAS 15K SP 146GB 3G SAS 15K DP 72GB 3G SAS 15K SP 72GB 3G SAS 15K DP	Up to 6 LFF	1-6	HP Smart Array E200i/64MB Controller HP Smart Array E200i/128 BBWC Controller HP Smart Array E500/256MB Controller HP Smart Array P400/256MB Controller HP Smart Array P400/512MB BBWC Controller HP Smart Array P600/256 BBWC Controller HP Smart Array P800/512 BBWC Controller

SAS Hot Plug 3.5" Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
1TB 7.2K 3.5" DP 750GB 7.2K 3.5" DP	Up to 6 LFF	1-6	HP Smart Array E200i/64MB Controller HP Smart Array E200i/128 BBWC Controller HP Smart Array E500/256MB Controller HP Smart Array P400/256MB Controller HP Smart Array P400/512MB BBWC Controller HP Smart Array P600/256 BBWC Controller HP Smart Array P800/512 BBWC Controller

SATA Hot Plug Entry (ETY) Drives

	Quantity Supported	Position Supported	Controller
250GB 3G 5.4K SFF 120GB 1.5G 5.4K SFF	Up to 8	1-8	HP Smart Array E200i/64MB Controller HP Smart Array E200i/128 BBWC Controller HP Smart Array E500/256MB Controller HP Smart Array P400/256MB Controller HP Smart Array P400/512MB BBWC Controller HP Smart Array P600/256 BBWC Controller HP Smart Array P800/512 BBWC Controller

NOTE: HP Systems Insight Manager should not be used to view the status of SATA hard drives and SATA RAID configurations.

SATA Hot Plug Entry (ETY) Drives

	Quantity Supported	Position Supported	Controller
160GB 3G SATA 7.2K	Up to 6	1-6	HP Smart Array E200i/64MB Controller HP Smart Array E200i/128 BBWC Controller HP Smart Array E500/256MB Controller HP Smart Array P400/256MB Controller HP Smart Array P400/512MB BBWC Controller HP Smart Array P600/256 BBWC Controller HP Smart Array P800/512 BBWC Controller

SATA Hot Plug Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
1TB 3G SATA 7.2K 750GB 3G SATA 7.2K 500GB 3G SATA 7.2K 250GB 3G SATA 7.2K	Up to 6	1-6	HP Smart Array E200i/64MB Controller HP Smart Array E200i/128 BBWC Controller HP Smart Array E500/256MB Controller HP Smart Array P400/256MB Controller HP Smart Array P400/512MB BBWC Controller HP Smart Array P600/256 BBWC Controller HP Smart Array P800/512 BBWC Controller

3.5" SATA Hot Plug Drives

	Quantity Supported	Position Supported	Controller
750GB 1.5G SATA 7.2K 500GB 1.5G SATA 7.2K 250GB 1.5G SATA 7.2K 160GB 1.5G SATA 7.2K	Up to 6	1-6	HP Smart Array E200i/64MB Controller HP Smart Array E200i/128 BBWC Controller HP Smart Array E500/256MB Controller HP Smart Array P400/256MB Controller HP Smart Array P400/512MB BBWC Controller HP Smart Array P600/256 BBWC Controller HP Smart Array P800/512 BBWC Controller

Small Form Factor (SFF) SATA Hot Plug Drives

	Quantity Supported	Position Supported	Controller
120GB 1.5G SATA 5.4K	Up to 6	1-6	HP Smart Array E200i/64MB Controller HP Smart Array E200i/128 BBWC Controller HP Smart Array E500/256MB Controller HP Smart Array P400/256MB Controller HP Smart Array P400/512MB BBWC Controller HP Smart Array P600/256 BBWC Controller HP Smart Array P800/512 BBWC Controller

External Storage

	Quantity Supported	Position Supported	Host Controller or Adapter
20 Modular Smart Array	Up to 2	External	Smart Array 6402/128 Controller Smart Array 6404/256 Controller
50 Modular Smart Array	Up to 2 Up to 4 Up to 4	External	HP Smart Array P600/256 BBWC Controller HP Smart Array P800
60 Modular Smart Array	Up to 4 Up to 8 Up to 8	External	HP Smart Array P600/256 BBWC Controller HP Smart Array P800 Controller HP Smart Array E500/256 BBWC Controller
70 Modular Smart Array	Up to 2 Up to 4 Up to 4	External	HP Smart Array P600/256 BBWC Controller HP Smart Array P800 Controller HP Smart Array E500/256 BBWC Controller
HP 2000sa Modular Smart Array Controller	Up to 4	External	HP SC08Ge Host Bus Adapter

Storage

Tape and Disk-Based Backup

NOTE: For a complete listing of compatible tape and disk-based backup offerings, please visit: www.hp.com/go/connect.

	Position Supported	Controller	Part Number
Internal USB Tape Drives DAT 40 USB DAT 72 USB DAT 160 USB	A,B,C,D	USB 2.0 Port	N/A
USB Tape Drives, External DAT 40 USB DAT 72 USB DAT 160 USB 1U Rack-Mount Kit	External	USB 2.0 Port	N/A
SCSI Tape Drives, Internal LTO-1 Ultrium 232 LTO-2 Ultrium 448 LTO-3 Ultrium 920 LTO-4 Ultrium 1760 DAT 40 DAT 72 DAT 160	A,B,C,D	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21
SCSI Tape Drives, Internal LTO-3 Ultrium 960 LTO-4 Ultrium 1840	A+B or C+D	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21
SCSI Tape Drives, External LTO-1 Ultrium 232 LTO-2 Ultrium 448 LTO-3 Ultrium 960 LTO-3 Ultrium 920 LTO-4 Ultrium 1760 LTO-4 Ultrium 1840 DAT 40 DAT 72 DAT 160 1U Rack-Mount Kit 3U Rack-Mount Kit	External	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21
SAS Tape Drives, Internal DAT 160 SAS LTO-2 Ultrium 448 SAS LTO-3 Ultrium 920 SAS LTO-4 Ultrium 1760 SAS	A,B,C,D	HP SC44Ge Host Bus Adapter	416096-B21

Storage

SAS Tape Drives, Internal LTO-4 Ultrium 1840 SAS	A+B or C+D	HP SC44Ge Host Bus Adapter	416096-B21
SAS Tape Drives, External DAT 160 SAS LTO-2 Ultrium 448 SAS LTO-3 Ultrium 920 SAS LTO-4 Ultrium 1760 SAS LTO-4 Ultrium 1840 SAS 1U Rack-Mount Kit 3U Rack-Mount Kit	External	HP SC44Ge Host Bus Adapter	416096-B21
SCSI Tape Automation, External DAT 72x10 Autoloader 1/8 G2 Autoloader MSL2024 MSL4048 MSL8096 MSL6000	External	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2 HP U320e SCSI Host Bus Adapter **NOTE:** Recommended for MSL tape libraries.	374654-B21 AH627A
SAS Tape Automation, External 1/8 G2 Autoloader MSL2024 MSL4048	External	HP SC44Ge Host Bus Adapter	416096-B21
HP StorageWorks Fibre Tape Automation, External MSL2024 MSL4048 MSL8096 MSL6000	External	Please consult the EBS connectivity matrix at: http://www.hp.com/go/ebs for detailed connectivity information	N/A
HP StorageWorks RDX Removable Disk Backup System, Internal RDX160 RDX320 RDX500	A,B,C,D	USB 2.0 Port	N/A
HP StorageWorks D2D Backup Systems D2D120 D2D130 D2D2503i D2D4004i	External	Embedded Network Controller	N/A

Power Specifications

Part Number	380622-001
Spare Kit	403781-001
Operational Input Voltage Range (V rms)	90 - 264
Frequency Range (Nominal) (Hz)	47 - 63 (50 / 60)

Nominal Input Voltage (Vrms)	**100**	**120**	**208**	**220**	**230**	**240**
Max Rated Output Wattage Rating	800	950	1000	1000	1000	1000
Nominal Input Current (A rms)	10.0	8.8	5.85	5.5	5.2	4.97
Max Rated Input Wattage Rating (Watts)	980	1035	1193	1186	1172	1169
Max. Rated VA (Volt-Amp)	1000	1056	1217	1210	1196	1193
Efficiency (%)	81.5	82	84	84	85	85.5
Power Factor	0.98	0.98	0.98	0.98	0.98	0.98
Leakage Current (mA)	0.44	0.52	0.91	0.96	1.00	1.04
Maximum Inrush Current (A peak)	30	30	30	30	30	30
Maximum Inrush Current duration (miliseconds)	3	3	3	3	3	3

NOTE: To review typical system power ratings use the HP Power Advisor which is available online located at url: www.hp.com/go/proliant-energy-efficient or www.hp.com/go/hppoweradvisor

To drill down to calculators:
- Click on: "ProLiant Servers"
- Click on the Server of interest. Example: ML350 G5
- Click on: "Power Calculator" link. (You may need to scroll down to see it)

System Unit	**Tower Dimensions** (H x W x D) (with feet/bezel)	18.39 x 8.59 x 23.46 in (46.7 x 21.8 x 59.6 cm)	
	Rack Dimensions (H x W x D) (with feet/bezel)	8.54 x 17.5 x 21.9 in. (21.7 x 44.5 x 55.7cm)	
	Tower Weight (approximate)	Maximum (all hard drives, power supplies, and processors installed)	67 lb (30.4 kg)
		Minimum (one hard drive, power supply, and processor installed)	50 lb (22.7 kg)
	Rack Weight (approximate)	Maximum (all hard drives, power supplies, and processors installed)	61 lb (27.7 kg)
		Minimum (one hard drive, power supply, and processor installed)	44 lb (20.0 kg)
	Max Input Requirements (per power supply)	Rated Line Voltage	100 VAC, 120 VAC 200 - 240 VAC
		Rated Input Current	10A (at 100 VAC) 9A (at 120 VAC) 6.1A (at 200 VAC)
		Rated Input Frequency	50 to 60 Hz
		Rated Input Power	980W (at 100 VAC) 1035W (at 120 VAC) 1170W (at 240 VAC)
	BTU Rating	BTU/HR	3350 BTU/hr (at 100 VAC) 3530 BTU/hr (at 120 VAC) 3990 BTU/hr (at 240 VAC)
	Power Specifications	**NOTE:** To review typical system power ratings use the HP Power Advisor which is available online located at url: www.hp.com/go/proliant-energy-efficient or www.hp.com/go/hppoweradvisor - Click on the system of interest. Example: ML350 G5 - Follow the instructions of the next screens.	
	Power Supply Output (per power supply)	Rated Steady-State Power	800 W (at 100 VAC) 850 W (at 120 VAC) 1000 W (at 200-240 VAC)
		Maximum Peak Power	800 W (at 100 VAC) 850 W (at 120 VAC) 1000 W (at 200-240 VAC)
	System Inlet Temperature	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed.

		System performance may be reduced if operating with a fan fault or above 30°C (86°F).
	Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
Relative Humidity (non-condensing)	Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
	Non-operating	5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
Altitude	Operating	3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
	Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
Acoustic Noise	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).	
	Idle	
	L WAd	5.2 B
	L pAm	35 dBA
	Operating	
	L WAd	5.3 B
	L pAm	35 dBA
Emissions Classification (EMC)	**FCC Rating**	Class B
	Normative Standards	CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; GB9254; K22;K24; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1

NOTE: Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.

Technical Specifications

Smart Array E200i Controller	**Disk Drive and Enclosure Interface**	3G SAS (Serial Attached SCSI) 1.5G SATA (Serial Advanced Technology Attachment)	
	SAS Connectors	2 internal (SFF8484) x4 wide port connectors	
	Cache Memory Speed	DDR-1/266 MHz provides up to 4.2 GB/s maximum bandwidth.	
	Server Interface	x4 2.5G PCIe provides 2GB/s maximum bandwidth.	
	SAS Speed	x8 3G SAS provides 2.4GB/s maximum bandwidth.	
	Cache Memory	40-bit 64MB ECC read cache or 40-bit 128MB ECC battery backed, transportable read/write cache	
	Logical Volumes Supported	Up to 32 logical volumes	
	Maximum Volume Capacity	4.5TB (6 x 750GB SATA)	
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space	
	RAID Support	RAID 5 (Distributed Data Guarding) RAID 1, 1+0 (Striping & Mirroring) RAID 0 (Striping)	
	Upgradeable Firmware	Upgradeable Firmware	
Embedded NC373i Multifunction Gigabit Server Adapter	**Network Interface**	10Base-T/100Base-TX/1000Base-TX	
	Compatibility	IEEE 802.3 10Base-T	
		IEEE 802.3ab 1000Base-T	
		IEEE 802.3u 100Base-TX	
	Data Transfer Method	PCI Express, four lanes (x4)	
	Network Transfer Rate	10Base-T (Half-Duplex)	10 Mb/s
		10Base-T (Full-Duplex)	20 Mb/s
		100Base-TX (Half-Duplex)	100 Mb/s
		100Base-TX (Full-Duplex)	200 Mb/s
		1000Base-TX (Half and Full-Duplex)	2000Mb/s
	Connector	RJ-45	
	Cable Support	10Base-T	Categories 3, 4 or 5 UTP; up to 328 ft (100 m)
		10/100/1000Base-TX	Category 5 UTP; up to 328 ft (100 m)

Environment-friendly Products and Approach	**End-of-life Management and Recycling**	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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For hard drives, 1GB = 1 billion bytes. Actual formatted capacity is less.